

# **Draft Environmental Impact Statement**

## **For The Generic Essential Fish Habitat Amendment to:**

SPINY LOBSTER FISHERY MANAGEMENT PLAN  
QUEEN CONCH FISHERY MANAGEMENT PLAN  
REEF FISH FISHERY MANAGEMENT PLAN  
CORAL FISHERY MANAGEMENT PLAN  
FOR THE U.S. CARIBBEAN

## **APPENDICES**

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## Appendix 1. Life history tables with habitats and ecological functions.

### Species: Sergeant major (*Abudefduf saxatilis*)

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Mangrove						Feeding	
Mar	Artificial reef				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Mangrove			Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Reef			Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	

### Species: Ocean sturgeonfish (*Acanthurus bahianus*)

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Mangrove						Feeding	
Mar	Artificial reef						Feeding	
Mar	Mangrove						Feeding	
Mar	Reef						Feeding	
Mar	Rubble						Feeding	

### Species: Doctorfish (*Acanthurus chirurgus*)

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Mangrove						Feeding	
Mar	Mangrove						Feeding	
Mar	Reef						Feeding	

### Species: Blue tang (*Acanthurus coeruleus*)

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Mangrove						Feeding	
Mar	Mangrove						Feeding	
Mar	Reef						Feeding	

### Species: Scrawled filefish (*Aluterus scriptus*)

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Feeding	

### Species: Redspotted hawkfish (*Amblycirrhitis pinos*)

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Feeding	

### Species: Porkfish (*Anisotremus virginicus*)

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Mangrove				Feeding, Growth to Maturity	Growth to Maturity	Unknown	
Est	Seagrasses					Growth to Maturity		
Mar	Hard Bottom			Feeding, Growth to Maturity	Feeding, Growth to Maturity		Feeding	
Mar	Mangrove				Feeding, Growth to Maturity	Growth to Maturity		
Mar	Reef			Feeding, Growth to Maturity	Feeding, Growth to Maturity	Growth to Maturity	Feeding	
Mar	Rubble			Feeding, Growth to Maturity	Feeding, Growth to Maturity		Feeding	
Mar	Seagrasses					Growth to Maturity		

**Species: Frogfish (*Antennarius* spp.)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Hard bottoms						Unknown	
Mar	Reef						Unknown	

**Species: Flamefish (*Apogon maculatus*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Feeding	

**Species: Black snapper (*Apsilus dentatus*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Hard bottoms						Feeding	
Mar	Reef						Feeding, Growth to Maturity	

**Species: Sea bream (*Archosargus rhomboidalis*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Mangrove					Growth to Maturity	Feeding	
Est	Seagrasses			Feeding, Growth to Maturity	Feeding, Growth to Maturity	Growth to Maturity	Feeding	
Est	Unknown							Spawning
Mar	Mangrove					Growth to Maturity	Feeding	
Mar	Reef					Growth to Maturity	Feeding	
Mar	Seagrasses			Feeding, Growth to Maturity	Feeding, Growth to Maturity	Growth to Maturity	Feeding	
Unk	Bare mud						Feeding	

**Species: Conchfish (*Astrapogon stellatus*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Rubble						Unknown	
Mar	Sand/Shell bottoms						Unknown	
Mar	Seagrasses						Unknown	

**Species: *Astrea tuber***

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef				Growth to Maturity	Growth to Maturity	Unknown	

**Species: Trumpetfish (*Aulostomus maculatus*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Feeding	

**Species: Queen triggerfish (*Balistes vetula*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Feeding	
Mar	Rubble						Feeding	



**Species: Spanish hogfish (*Bodianus rufus*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Mangrove						Feeding	
Mar	Artificial reef					Feeding, Growth to Maturity	Feeding	
Mar	Hard bottom					Feeding, Growth to Maturity	Feeding	
Mar	Mangrove					Feeding, Growth to Maturity	Feeding	
Mar	Reef						Feeding	

**Species: Peacock flounder (*Bothus lunatus*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Feeding	
Mar	Rubble						Feeding	
Mar	Soft bottom					Feeding, Growth to Maturity	Feeding	

**Species: Jolthead porqy (*Calamus bajonado*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef				Growth to Maturity	Growth to Maturity	Feeding	
Mar	Sand/Shell bottoms				Growth to Maturity	Growth to Maturity	Feeding	
Mar	Seagrasses				Growth to Maturity	Growth to Maturity	Feeding	

**Species: Sheepshead porqy (*Calamus penna*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Hard bottoms						Feeding	
Mar	Reef						Feeding	
Mar	Sand/Shell bottoms						Feeding	
Mar	Seagrasses						Feeding	

**Species: Pluma (*Calamus pennatula*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Feeding	
Mar	Rubble						Feeding	

**Species: Whitespotted filefish (*Cantherhines macrocerus*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Feeding	

**Species: Ocean triggerfish (*Canthidermis sufflamen*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Feeding	Spawning

**Species: Sharpnose puffer (*Canthigaster rostrata*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Seagrasses				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Reef				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Rubble				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Seagrasses				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	

**Species: Yellow jack (*Caranx barthelomaei*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Seagrasses					Feeding, Growth to Maturity	Feeding	
Mar	Reef					Feeding, Growth to Maturity	Feeding	
Mar	Seagrasses					Feeding, Growth to Maturity	Feeding	

**Species: Blue runner (*Caranx crysos*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef					Feeding, Growth to Maturity	Feeding	
Mar	Rubble					Feeding, Growth to Maturity	Feeding	

**Species: Horse-eye jack (*Caranx latus*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Mangrove						Feeding	
Est	Seagrasses						Feeding	
Mar	Mangrove						Feeding	
Mar	Reef					Feeding, Growth to Maturity	Feeding	
Mar	Seagrasses						Feeding	

**Species: Black jack (*Caranx luqubris*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Pelagic						Unknown	
Mar	Reef						Unknown	

**Species: Bar jack (*Caranx ruber*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Mangrove						Feeding	
Est	Seagrasses						Feeding	
Mar	Mangrove						Feeding	
Mar	Reef					Feeding, Growth to Maturity	Feeding	
Mar	Rubble					Feeding, Growth to Maturity	Feeding	
Mar	Seagrasses						Feeding	

**Species: Sharpnose puffer (*Canthigaster rostrata*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Seagrasses				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Reef				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Rubble				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Seagrasses				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	

**Species: Yellow jack (*Caranx barthelomaei*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Seagrasses					Feeding, Growth to Maturity	Feeding	
Mar	Reef					Feeding, Growth to Maturity	Feeding	
Mar	Seagrasses					Feeding, Growth to Maturity	Feeding	

**Species: Blue runner (*Caranx crysos*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef					Feeding, Growth to Maturity	Feeding	
Mar	Rubble					Feeding, Growth to Maturity	Feeding	

**Species: Horse-eye jack (*Caranx latus*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Mangrove						Feeding	
Est	Seagrasses						Feeding	
Mar	Mangrove						Feeding	
Mar	Reef					Feeding, Growth to Maturity	Feeding	
Mar	Seagrasses						Feeding	

**Species: Black jack (*Caranx lugubris*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Pelagic						Unknown	
Mar	Reef						Unknown	

**Species: Bar jack (*Caranx ruber*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Mangrove						Feeding	
Est	Seagrasses						Feeding	
Mar	Mangrove						Feeding	
Mar	Reef					Feeding, Growth to Maturity	Feeding	
Mar	Rubble					Feeding, Growth to Maturity	Feeding	
Mar	Seagrasses						Feeding	

**Species: *Cassia flammea***

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Seagrasses	Spawning						Spawning
Mar	Seagrasses						Feeding	

**Species: *Cassia madagascarensis***

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Seagrasses				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	

**Species: *Cassia tuberosa***

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Hard bottoms						Feeding	
Mar	Seagrasses				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	

**Species: Blackline tilefish (*Caulolatilus cyanops*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Hard bottoms						Feeding	
Mar	Pelagic	Growth to Maturity	Growth to Maturity					
Mar	Sand/Shell bottoms						Feeding	
Mar	Soft bottoms						Feeding	

**Species: Cherubfish (*Centropyge argu*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Feeding	

**Species: Atlantic spadefish (*Chaetodipterus faber*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Feeding	

**Species: Longsnout butterflyfish (*Cheato don aculeatus*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef	Growth to Maturity					Unknown	Spawning
Mar	Rubble						Unknown	

**Species: Fourve butterflyfish (*Cheato don capistratus*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Mangrove					Growth to Maturity	Unknown	
Est	Seagrasses					Growth to Maturity	Unknown	
Mar	Artificial reef				Growth to Maturity	Growth to Maturity		
Mar	Benthic algae				Growth to Maturity			
Mar	Mangrove					Growth to Maturity	Unknown	
Mar	Reef				Growth to Maturity	Growth to Maturity	Unknown	Spawning
Mar	Rubble						Unknown	
Mar	Sand/Shell bottoms						Unknown	
Mar	Seagrasses				Growth to Maturity	Growth to Maturity	Unknown	

**Species: Spotfin butterflyfish (*Chaetodon ocellatus*)**

LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Feeding	

**Species: Banded butterflyfish (*Chaetodon striatus*)**

LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Mangrove						Unknown	
Est	Seagrasses						Unknown	
Mar	Mangrove						Unknown	
Mar	Pelagic	Growth to Maturity	Growth to Maturity					
Mar	Reef						Unknown	Spawning
Mar	Rubble						Unknown	
Mar	Sand/Shell bottoms						Unknown	
Mar	Seagrasses						Unknown	

**Species: *Charonia variegata***

LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Hard bottoms						Feeding	
Mar	Sand/Shell bottoms						Feeding	

**Species: Blue Chromis (*Chromis cyaneus*)**

LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef			Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	

**Species: Sunshinefish (*Chromis insolatus*)**

LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Feeding	

**Species: *Cittarium pica***

LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Hard bottoms				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	

**Species: Creole wrasse (*Clepticus parrai*)**

LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Feeding	

**Species: Flying gurnard (*Dactylopterus volitans*)**

LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Sand/Shell bottoms				Growth to Maturity	Growth to Maturity	Unknown	
Mar	Seagrasses				Growth to Maturity	Growth to Maturity	Unknown	
Mar	Soft bottoms				Growth to Maturity	Growth to Maturity	Unknown	

**Species: Porcupinefish (*Diodon hystrix*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Seagrasses					Feeding, Growth to Maturity	Feeding	
Mar	Hard bottom					Feeding, Growth to Maturity	Feeding	
Mar	Reef					Feeding, Growth to Maturity	Feeding	
Mar	Seagrasses					Feeding, Growth to Maturity	Feeding	

**Species: Chain moray (*Echidna catenata*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Feeding	

**Species: Rock hind (*Epinephelus adscensionis*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Artificial Reef				Growth to Mat	Growth to Maturity		
Mar	Hard bottoms						Feeding	Spawning
Mar	Pelagic	Growth to Maturity	Growth to Maturity					
Mar	Reef						Feeding	Spawning

**Species: Graysby (*Epinephelus cruentatus*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Mangrove					Growth to Maturity		
Est	Seagrasses					Growth to Maturity		
Mar	Mangrove					Growth to Maturity		
Mar	Reef					Growth to Maturity	Feeding	Spawning
Mar	Rubble						Feeding	
Mar	Seagrasses					Growth to Maturity		

**Species: Yellowedge grouper (*Epinephelus flavolimbatus*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Hard bottoms					Growth to Maturity	Feeding	
Mar	Pelagic	Growth to Maturity	Growth to Maturity					

**Species: Coney (*Epinephelus fulvus*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Artificial Reef				Growth to Maturity		Feeding	
Mar	Benthic algae				Growth to Maturity			
Mar	Hard bottoms						Feeding	Spawning
Mar	Reef					Growth to Maturity	Feeding	Spawning
Mar	Rubble						Feeding	
Mar	Sand/Shell bottoms						Feeding	
Mar	Seagrasses						Feeding	

**Species: Red hind (*Epinephelus guttatus*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Mangrove					Feeding, Growth to Maturity		
Est	Seagrasses					Feeding, Growth to Maturity		
Mar	Artificial reef				Growth to Maturity			
Mar	Hard bottoms					Feeding, Growth to Maturity	Feeding	
Mar	Mangrove					Feeding, Growth to Maturity		
Mar	Pelagic	Growth to Maturity	Feeding, Growth to Maturity					
Mar	Reef			Growth to Maturity		Feeding, Growth to Maturity	Feeding	Feeding, Spawning
Mar	Rubble				Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Sand/Shell bottoms				Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Seagrasses					Feeding, Growth to Maturity		

**Species: Goliath grouper (*Epinephelus itajara*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Artificial structures						Feeding	
Est	Mangrove		Growth to Maturity	Growth to Maturity	Feeding, Growth to Maturity	Feeding, Growth to Maturity		
Est	Seagrasses				Feeding, Growth to Maturity	Feeding, Growth to Maturity		
Mar	Artificial reef						Feeding	
Mar	Hard bottoms					Feeding, Growth to Maturity	Feeding	Spawning
Mar	Mangrove			Growth to Maturity	Feeding, Growth to Maturity	Feeding, Growth to Maturity		
Mar	Pelagic	Growth to Maturity	Growth to Maturity					
Mar	Reef				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	Spawning
Mar	Seagrasses				Feeding, Growth to Maturity	Feeding, Growth to Maturity		
Mar	Shoals/Banks						Feeding	

**Species: Red Grouper (*Epinephelus morio*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Seagrasses				Feeding, Growth to Maturity			
Mar	Artificial reef						Feeding	
Mar	Hard bottoms				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Pelagic	Growth to Maturity	Feeding, Growth to Maturity					
Mar	Reef				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Seagrasses				Feeding, Growth to Maturity			

**Species: Misty grouper (*Epinephelus mystacinus*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Hard bottoms						Feeding	Spawning
Mar	Pelagic	Growth to Maturity	Growth to Maturity					
Mar	Reef							Spawning

**Species: Nassau grouper (*Epinephelus striatus*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Mangrove					Growth to Maturity		
Est	Seagrasses					Growth to Maturity		
Mar	Artificial reef					Growth to Maturity	Feeding	
Mar	Benthic algae				Feeding, Growth to Maturity			
Mar	Mangrove					Growth to Maturity		
Mar	Reef				Feeding, Growth to Maturity	Growth to Maturity	Feeding	Spawning
Mar	Seagrasses				Feeding, Growth to Maturity	Growth to Maturity		

**Species: High-hat (*Equetus acuminatus*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Seagrasses						Feeding	
Mar	Reef						Feeding	
Mar	Rubble						Feeding	
Mar	Seagrasses						Feeding	



**Species: Jackknife-fish (*Equetus lanceolatus*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Hard bottoms				Growth to Maturity	Growth to Maturity	Unknown	
Mar	Reef				Growth to Maturity	Growth to Maturity	Unknown	
Mar	Sand/Shell bottoms				Growth to Maturity	Growth to Maturity	Unknown	
Mar	Seagrasses				Growth to Maturity	Growth to Maturity	Unknown	

**Species: Spotted Drum (*Equetus punctatus*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Feeding	

**Species: Queen snapper (*Etilis oculatus*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Bare sand						Feeding	
Mar	Hard bottoms					Growth to Maturity	Feeding	
Mar	Pelagic	Growth to Maturity	Growth to Maturity					
Unk	Rubble					Growth to Maturity		

**Species: *Fasciolaria tulipa***

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Hard bottoms						Feeding	
Mar	Reef						Feeding	
Mar	Seagrasses						Feeding	

**Species: Neon goby (*Gobiosoma oceanops*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Feeding	

**Species: Royal gramma (*Gramma loreto*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Feeding	

**Species: Green moray (*Gymnothorax funebris*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Feeding	

**Species: Goldentail moray (*Gymnothorax miliaris*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Feeding	

**Species: Marqate (*Haemulon album*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Mangrove					Growth to Maturity		
Mar	Hard bottom					Feeding, Growth to Maturity	Feeding	
Mar	Mangrove					Growth to Maturity		
Mar	Reef					Feeding, Growth to Maturity	Feeding, Unknown	

**Species: Tomtate (*Haemulon aurolineatum*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Mangrove				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Est	Seagrasses				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Artificial reef			Growth to Maturity	Growth to Maturity			
Mar	Mangrove					Feeding, Growth to Maturity	Feeding	
Mar	Reef			Feeding, Growth to Maturity	Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Rubble			Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Seagrasses			Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	

**Species: French grunt (*Haemulon flavolineatum*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Artificial reef			Growth to Maturity				
Est	Mangrove				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Est	Seagrasses			Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Artificial reef			Feeding	Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Benthic algae			Feeding, Growth to Maturity	Growth to Maturity			
Mar	Mangrove				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Pelagic		Growth to Maturity					
Mar	Reef			Growth to Maturity	Growth to Maturity	Growth to Maturity	Unknown	
Mar	Rubble			Feeding, Growth to Maturity	Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Seagrasses			Feeding, Growth to Maturity	Growth to Maturity	Feeding, Growth to Maturity	Feeding	

**Species: White grunt (*Haemulon plumieri*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Mangrove				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Est	Seagrasses			Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Artificial reef			Feeding, Growth to Maturity	Growth to Maturity	Feeding, Growth to Maturity	Unknown	
Mar	Mangrove				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Reef			Feeding, Growth to Maturity	Growth to Maturity	Feeding, Growth to Maturity	Feeding, Unknown	Spawning
Mar	Rubble			Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Seagrasses			Feeding, Growth to Maturity	Growth to Maturity	Feeding, Growth to Maturity	Feeding	

**Species: Bluestriped grunt (*Haemulon sciurus*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Mangrove				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Est	Seagrasses			Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Mangrove				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Reef			Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Rubble			Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Seagrasses			Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	

**Species: Yellowcheek wrasse (*Halichoeres cyanocephalus*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Feeding	

**Species: Yellowhead wrasse (*Halichoeres garnoti*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Mangrove						Feeding	
Mar	Artificial reef						Feeding	
Mar	Mangrove						Feeding	
Mar	Reef						Feeding	

**Species: Clown wrasse (*Halichoeres radiatus*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Feeding	
Mar	Rubble						Feeding	

**Species: Pearly razorfish (*Hemipteronotus novacula*)**

LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Rubble						Feeding	

**Species: Green razorfish (*Hemipteronotus splendens*)**

LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Rubble						Feeding	

**Species: Seahorses (*Hippocampus* spp.)**

LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Seagrasses				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Hard bottoms				Growth to Maturity	Growth to Maturity	Unknown	
Mar	Seagrasses				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	

**Species: Queen angelfish (*Holacanthus ciliaris*)**

LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Hard bottom				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Reef				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	

**Species: Rock beauty (*Holacanthus tricolor*)**

LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Unknown	

**Species: Squirrelfish (*Holocentrus ascensionis*)**

LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Feeding	

**Species: Longspine squirrelfish (*Holocentrus rufus*)**

LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Mangrove						Feeding	
Mar	Artificial Reef						Feeding	
Mar	Mangrove						Feeding	
Mar	Reef						Feeding	

**Species: Butter hamlet (*Hypoplectrus unicolor*)**

LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Feeding	

**Species: Hogfish (*Lachnolaimus maximus*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Seagrasses				Feeding, Growth to Maturity	Feeding, Growth to Maturity		
Mar	Artificial reef				Growth to Maturity	Growth to Maturity	Feeding	
Mar	Hard bottoms						Feeding	Spawning
Mar	Reef	Growth to Maturity					Feeding	Spawning
Mar	Seagrasses				Feeding, Growth to Maturity	Feeding, Growth to Maturity		

**Species: Spotted trunkfish (*Lactophrys bicaudalis*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Seagrasses						Feeding	
Mar	Seagrasses						Feeding	

**Species: Honeycomb cowfish (*Lactophrys polygona*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Feeding	
Mar	Rubble						Feeding	

**Species: Scrawled cowfish (*Lactophrys quadricornis*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Seagrasses						Feeding	
Mar	Seagrasses						Feeding	

**Species: Trunkfish (*Lactophrys trigonus*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Seagrasses						Feeding	
Mar	Seagrasses						Feeding	

**Species: Smooth trunkfish (*Lactophrys triqueter*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Feeding	
Mar	Rubble						Feeding	

**Species: Swissgard basslet (*Liopropoma rubre*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
		NO DATA	NO DATA	NO DATA	NO DATA	NO DATA	NO DATA	NO DATA

**Species: Mutton snapper (*Lutjanus analis*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Emergent marshes				Growth to Maturity	Growth to Maturity		
Est	Mangrove				Growth to Maturity	Growth to Maturity	Feeding	
Est	Seagrasses				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Benthic algae						Feeding	
Mar	Mangrove				Growth to Maturity	Growth to Maturity	Feeding	
Mar	Reef	Growth to Maturity	Growth to Maturity	Growth to Maturity	Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	Spawning
Mar	Sand/Shell bottoms						Feeding	
Mar	Seagrasses				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Shoals/Banks							Spawning

**Species: Schoolmaster (*Lutjanus apodus*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Artificial structures				Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Est	Emergent marshes					Feeding, Growth to Maturity		
Est	Mangrove				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Est	Seagrasses				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Hard bottoms				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Mangrove				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Pelagic	Growth to Maturity	Growth to Maturity					
Mar	Reef				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	Spawning
Mar	Seagrasses				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	

**Species: Blackfin snapper (*Lutjanus buccanella*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Artificial reef				Feeding, Growth to Maturity			
Mar	Hard bottoms				Growth to Maturity	Growth to Maturity	Feeding	Spawning
Mar	Pelagic	Growth to Maturity						
Mar	Reef				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Rubble				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	

**Species: Gray Snapper (*Lutjanus griseus*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Emergent marshes				Feeding, Growth to Maturity	Feeding, Growth to Maturity		
Est	Mangrove				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Est	Sand/Shell bottoms						Feeding	
Est	Seagrasses			Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Mangrove				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Pelagic	Growth to Maturity	Growth to Maturity					
Mar	Reef	Growth to Maturity	Growth to Maturity		Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	Spawning
Mar	Seagrasses			Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Shoals/Banks							Spawning

**Species: Dog snapper (*Lutjanus jocu*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Artificial structures					Feeding, Growth to Maturity	Feeding	
Est	Mangrove				Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Est	Seagrasses				Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Hard bottoms					Feeding, Growth to Maturity	Feeding	
Mar	Mangrove				Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Pelagic	Growth to Maturity	Growth to Maturity					
Mar	Reef					Feeding, Growth to Maturity	Feeding	Spawning
Mar	Seagrasses				Growth to Maturity	Feeding, Growth to Maturity	Feeding	

**Species: Mahoqany snapper (*Lutjanus mahoqoni*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Mangrove					Growth to Maturity		
Est	Seagrasses				Feeding, Growth to Maturity	Growth to Maturity		
Mar	Artificial reef				Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Benthic algae				Growth to Maturity			
Mar	Hard bottoms				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Mangrove					Growth to Maturity		
Mar	Pelagic	Growth to Maturity	Growth to Maturity					
Mar	Reef				Growth to Maturity	Growth to Maturity	Feeding	
Mar	Rubble				Growth to Maturity	Growth to Maturity	Feeding	
Mar	Sand/Shell bottoms						Feeding	
Mar	Seagrasses				Growth to Maturity	Growth to Maturity	Feeding	

**Species: Lane Snapper (*Lutjanus synagris*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Mangrove				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Est	Sand/Shell bottoms				Feeding, Growth to Maturity	Feeding, Growth to Maturity		
Est	Seagrasses			Growth to Maturity	Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Est	Soft bottoms				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Artificial reef				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Hard bottom			Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Mangrove				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Pelagic	Growth to Maturity						
Mar	Reef			Growth to Maturity	Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Sand/Shell bottoms				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	Spawning
Mar	Seagrasses			Growth to Maturity	Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Shoals/Banks						Feeding	
Mar	Soft bottoms				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	



**Species: Silk snapper (*Lutjanus vivanus*)**

**LIFESTAGE**

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Hard bottoms						Feeding	
Mar	Rubble						Feeding	
Mar	Sand/Shell bottoms						Feeding	
Mar	Soft bottoms						Feeding	

**Species: Sand tilefish (*Malacanthus plumieri*)**

**LIFESTAGE**

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Rubble						Feeding	

**Species: Black durgon (*Melichthys niger*)**

**LIFESTAGE**

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
						Feeding, Growth to Maturity		
Mar	Reef						Feeding	
Mar	Rubble						Feeding	

**Species: Yellowtail demselfish (*Microspathodon chrysurus*)**

**LIFESTAGE**

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Mangrove						Feeding	
Mar	Mangrove						Feeding	
Mar	Reef			Feeding, Growth to Maturity	Feeding, Growth to Maturity	Growth to Maturity	Feeding	

**Species: Yellow goatfish (*Mulloidichthys martinicus*)**

**LIFESTAGE**

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Mangrove						Feeding	
Mar	Mangrove						Feeding	
Mar	Reef						Feeding	
Mar	Rubble						Feeding	

**Species: Tiger grouper (*Mycteroperca tigris*)**

**LIFESTAGE**

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Hard bottoms						Unknown	
Mar	Reef						Unknown	Spawning

**Species: Yellowfin grouper (*Mycteroperca veneosa*)**

**LIFESTAGE**

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Seagrasses				Growth to Maturity	Growth to Maturity		
Mar	Hard bottoms					Growth to Maturity	Feeding	Spawning
Mar	Reef					Growth to Maturity	Feeding	
Mar	Seagrasses				Growth to Maturity	Growth to Maturity		

**Species: Goldspotted eel (*Myrichthys oculatus*)**

**LIFESTAGE**

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Unknown	
Mar	Sand/Shell bottoms						Unknown	
Mar	Seagrasses						Unknown	
Mar	Soft bottoms						Unknown	

**Species: Blackbar soldierfish (*Myripristis jacobus*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Feeding	

**Species: Yellowtail Snapper (*Ocyurus chrysurus*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Artificial structures				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Est	Mangrove				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Est	Sand/Shell bottoms				Feeding, Growth to Maturity			
Est	Seagrasses			Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Est	Soft bottoms				Feeding, Growth to Maturity			
Mar	Artificial reef			Feeding, Growth to Maturity	Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Artificial structures				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Hard bottoms			Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Mangrove				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Pelagic	Growth to Maturity						
Mar	Reef			Feeding, Growth to Maturity	Growth to Maturity	Breeding, Feeding, Growth to Maturity	Feeding	
Mar	Rubble			Feeding, Growth to Maturity	Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Seagrasses			Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Shoals/Banks						Feeding	
Mar	Soft bottoms				Feeding, Growth to Maturity			

**Species: Batfish (*Ogcocephalus* spp.)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Hard bottoms						Unknown	
Mar	Reef						Unknown	
Mar	Seagrasses						Unknown	

**Species: Redlip blenny (*Ophioblennius atlanticus*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef					Feeding, Growth to Maturity	Feeding	

**Species: Yellowhead jawfish (*Opistognathus aurifrons*)**

LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Rubble						Feeding	

**Species: Dusky jawfish (*Opistognathus whitehursti*)**

LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Rubble						Feeding	

**Species: Caribbean spiny lobster (*Panulirus argus*)**

LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Benthic algae				Feeding, Growth to Maturity			
Est	Mangrove					Feeding, Growth to Maturity		
Est	Seagrasses					Feeding, Growth to Maturity	Feeding	
Mar	Benthic algae			Growth to Maturity	Feeding, Growth to Maturity			
Mar	Hard bottoms				Feeding, Growth to Maturity		Feeding	
Mar	Mangrove					Feeding, Growth to Maturity		
Mar	Pelagic		Feeding, Growth to Maturity					
Mar	Reef	Growth to Maturity			Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	Spawning
Mar	Seagrasses			Growth to Maturity		Feeding, Growth to Maturity	Feeding	

**Species: Spotted spiny lobster (*Panulirus guttatus*)**

LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Pelagic		Growth to Maturity					
Mar	Reef	Growth to Maturity		Growth to Maturity	Growth to Maturity	Growth to Maturity	Feeding	Spawning

**Species: Smoothtail spiny lobster (*Panulirus laevis*)**

LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Unknown	

**Species: Creole-fish (*Paranthias furcifer*)**

LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Feeding	Spawning

**Species: Cardinal soldierfish (*Plectropops retrospinis*)**

LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
		NO DATA	NO DATA	NO DATA	NO DATA	NO DATA	NO DATA	NO DATA

**Species: Gray angelfish (*Pomacanthus arcuatus*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Mangrove						Feeding	
Est	Seagrasses						Feeding	
Mar	Mangrove						Feeding	
Mar	Reef					Feeding, Growth to Maturity	Feeding	
Mar	Rubble					Feeding, Growth to Maturity	Feeding	
Mar	Seagrasses						Feeding	

**Species: French angelfish (*Pomacanthus paru*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef					Feeding, Growth to Maturity	Feeding	

**Species: Dusky damselfish (*Pomacentrus fuscus*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Feeding	Spawning

**Species: BeauGregory (*Pomacentrus leucostictus*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Mangrove						Feeding	
Mar	Mangrove						Feeding	
Mar	Reef			Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	Spawning

**Species: Bicolor damselfish (*Pomacentrus partitus*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Mangrove						Feeding	
Mar	Artificial reef						Feeding	
Mar	Mangrove						Feeding	
Mar	Reef				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Rubble				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	

**Species: Threespot damselfish (*Pomacentrus planifrons*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	Spawning

**Species: Bigeye (*Priacanthus arenatus*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Hard bottoms				Growth to Maturity	Growth to Maturity	Unknown	
Mar	Reef				Growth to Maturity	Growth to Maturity	Unknown	

**Species: Glasseye snapper (*Priacanthus cruentatus*)**

LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Feeding	

**Species: Rusty goby (*Prionolepis hipoliti*)**

LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
No data	No data	No data	No data	No data	No data	No data	No data	No data

**Species: Wenchman (*Pristipomoides aquilonaris*)**

LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Hard bottoms						Feeding	
Mar	Pelagic	Growth to Maturity	Growth to Maturity					
Mar	Rubble						Feeding	
Mar	Sand/Shell bottoms						Feeding	Spawning

**Species: Spotted goatfish (*Pseudupeneus malculatus*)**

LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Seagrasses						Feeding	
Mar	Reef						Feeding	
Mar	Rubble						Feeding	
Mar	Seagrasses						Feeding	

**Species: Vermillion Snapper (*Rhomboplites aurorubens*)**

LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Artificial reef				Growth to Maturity	Growth to Maturity	Feeding	
Mar	Hard bottoms				Growth to Maturity	Growth to Maturity	Feeding	
Mar	Reef				Growth to Maturity	Growth to Maturity	Feeding	

**Species: Greater soapfish (*Rypticus saponaceus*)**

LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Mangrove					Growth to Maturity		
Est	Seagrasses					Growth to Maturity		
Mar	Hard bottoms				Growth to Maturity	Growth to Maturity	Unknown	
Mar	Mangrove					Growth to Maturity		
Mar	Reef				Growth to Maturity	Growth to Maturity	Unknown	
Mar	Seagrasses					Growth to Maturity		

**Species: Midnight parrotfish (*Scarus coelestinus*)**

LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Feeding	

**Species: Blue parrotfish (*Scarus coeruleus*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Hard bottoms				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Reef				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding, Growth to Maturity	
Mar	Seagrasses				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	

**Species: Striped parrotfish (*Scarus croicensis*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Mangrove						Feeding	
Est	Seagrasses						Feeding	
Mar	Artificial reef						Feeding	
Mar	Mangrove						Feeding	
Mar	Reef						Feeding	
Mar	Rubble						Feeding	
Mar	Seagrasses						Feeding	

**Species: Rainbow parrotfish (*Scarus guacamaia*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Mangrove						Feeding	
Mar	Mangrove						Feeding	
Mar	Reef						Feeding	

**Species: Princess parrotfish (*Scarus taeniopterus*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Feeding	

**Species: Queen parrotfish (*Scarus vetula*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Feeding	

**Species: Greater amberjack (*Seriola dumerili*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Drift Algae				Growth to Maturity	Growth to Maturity		
Mar	Pelagic	Growth to Maturity	Growth to Maturity	Growth to Maturity			Unknown	Spawning
Mar	Reef						Unknown	

**Species: Almaco jack (*Seriola rivoliana*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Drift Algae				Growth to Maturity	Growth to Maturity		
Mar	Pelagic	Growth to Maturity					Unknown	Spawning

**Species: Scorpionfishes (*Scorpaenidae*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Hard bottoms				Growth to Maturity	Growth to Maturity	Feeding	
Mar	Reef				Growth to Maturity	Growth to Maturity	Feeding	

**Species: Orangeback bass (*Seranus annularis*)**

## LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Hard bottoms						Unknown	
Mar	Reef						Unknown	

**Species: Lantern bass (*Serranus baldwini*)**

## LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Artificial reef				Growth to Maturity			
Mar	Rubble						Feeding	

**Species: Tobaccofish (*Serranus tabacarius*)**

## LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Artificial reef				Growth to Maturity			
Mar	Reef						Feeding	
Mar	Rubble						Feeding	

**Species: Harlequin bass (*Serranus tigrinus*)**

## LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Artificial Reef				Growth to Maturity			
Mar	Hard bottoms						Unknown	
Mar	Reef						Unknown	

**Species: Chalk bass (*Serranus tortugarum*)**

## LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Rubble						Feeding	

**Species: Redband parrotfish (*Sparisoma aurofrenatum*)**

## LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Feeding	

**Species: Redtail parrotfish (*Sparisoma chrysopterus*)**

## LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Mangrove						Feeding	
Est	Seagrasses						Feeding	
Mar	Artificial reef						Feeding	
Mar	Mangrove						Feeding	
Mar	Reef						Feeding	
Mar	Seagrasses						Feeding	

**Species: Redfin parrotfish (*Sparisoma rubripinne*)**

## LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Feeding	

**Species: Stoplight parrotfish (*Sparisoma viride*)**

## LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Mangrove						Feeding	
Mar	Artificial reef						Feeding	
Mar	Mangrove						Feeding	
Mar	Reef						Feeding	

**Species: *Strombus costatus***

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Benthic algae				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Hard bottoms						Feeding	
Mar	Seagrasses				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	

**Species: *Strombus gallus***

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Benthic algae						Feeding	
Mar	Seagrasses						Feeding	

**Species: *Strombus gigas***

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Benthic algae						Feeding	
Mar	Hard bottoms						Feeding	
Mar	Pelagic		Feeding, Growth to Maturity					
Mar	Reef						Feeding	
Mar	Rubble						Feeding	
Mar	Sand/Shell bottoms	Growth to Maturity			Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	Spawning
Mar	Seagrasses					Feeding, Growth to Maturity	Feeding	Spawning

**Species: *Strombus pugilis***

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Benthic algae				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Hard bottoms						Feeding	
Mar	Seagrasses				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	

**Species: *Strombus raninus***

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Seagrasses						Feeding	

**Species: Caribbean tonguefish (*Symphurus arawak*)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
No data	No data	No data	No data	No data	No data	No data	No data	No data

**Species: Pipefishes (*Syngnathus* spp.)**

LIFESTAGE								
CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Seagrasses				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	
Mar	Seagrasses				Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	



**Species: Sand diver (*Synodus intermedius*)**

LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Rubble						Feeding	

**Species: Bluehead wrasse (*Thalassoma bifasciatum*)**

LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Est	Mangrove						Feeding	
Mar	Artificial reef						Feeding	
Mar	Mangrove						Feeding	
Mar	Reef			Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	Spawning
Mar	Rubble			Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding, Growth to Maturity	Feeding	

**Species: *Vasum muricatum***

LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Benthic algae						Feeding	
Mar	Seagrasses						Feeding	

**Species: Sargassum triquarterfish (*Xanthichthys ringens*)**

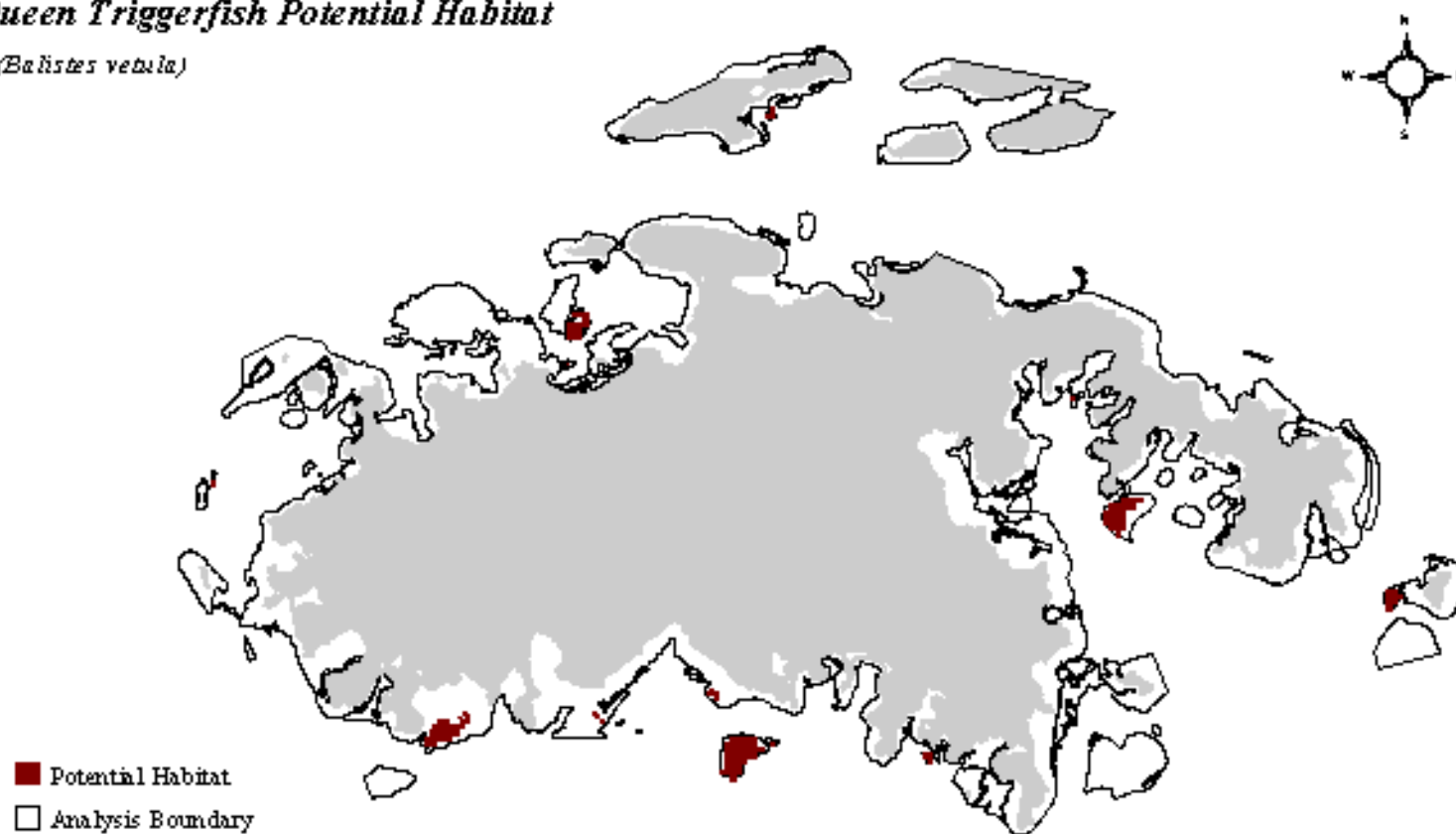
LIFESTAGE

CLASS	SUBSTRATE	Eggs	Larvae	Postlarvae	Early juvenile	Late juvenile	Adults	Spawning adults
Mar	Reef						Feeding	

Appendix 2. Habitat suitability index maps (potential habitat) for selected species (NOS from Generic EFH Amendment).

### ***Queen Triggerfish Potential Habitat***

*(Balistes vetula)*

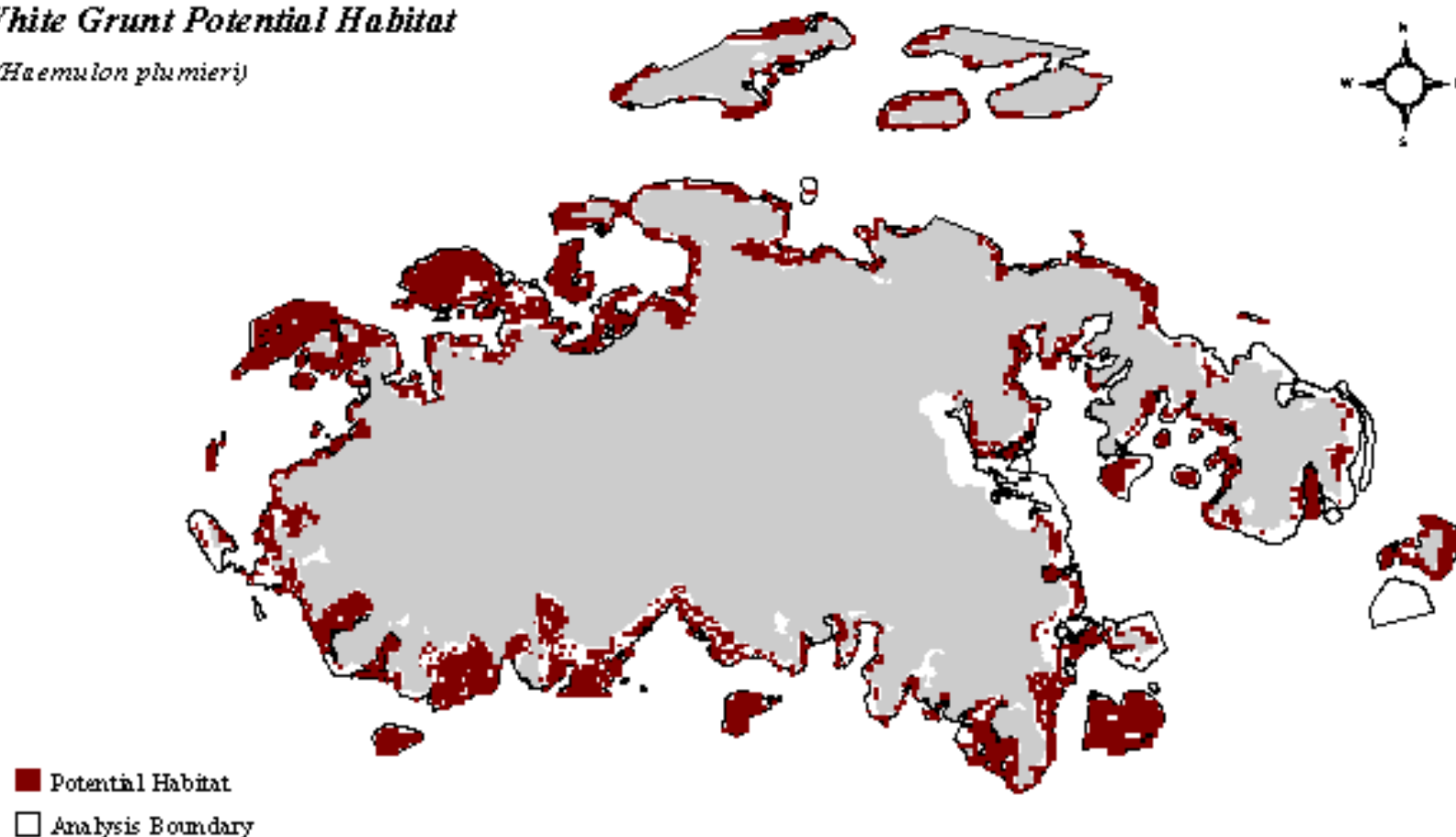


Prepared by NO S/BCB  
For the Caribbean Fisheries Management Council  
July, 1998

Data Provided by the National Park Service,  
the University of Puerto Rico, the University of Miami,  
the Caribbean Fishery Management Council, and the CDC

### *White Grunt Potential Habitat*

*(Haemulon plumieri)*

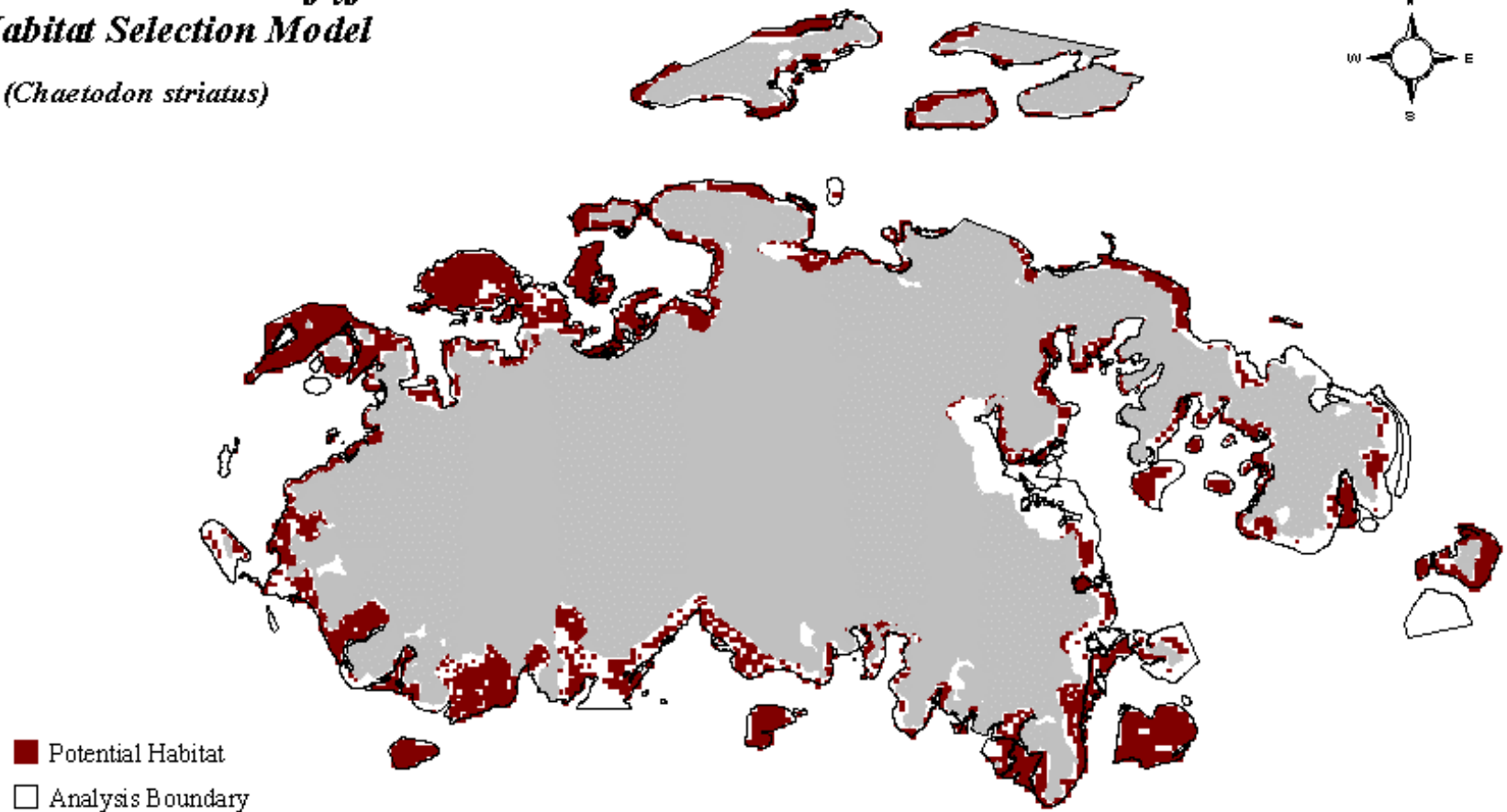


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***Adult Banded Butterflyfish***  
***Habitat Selection Model***

*(Chaetodon striatus)*

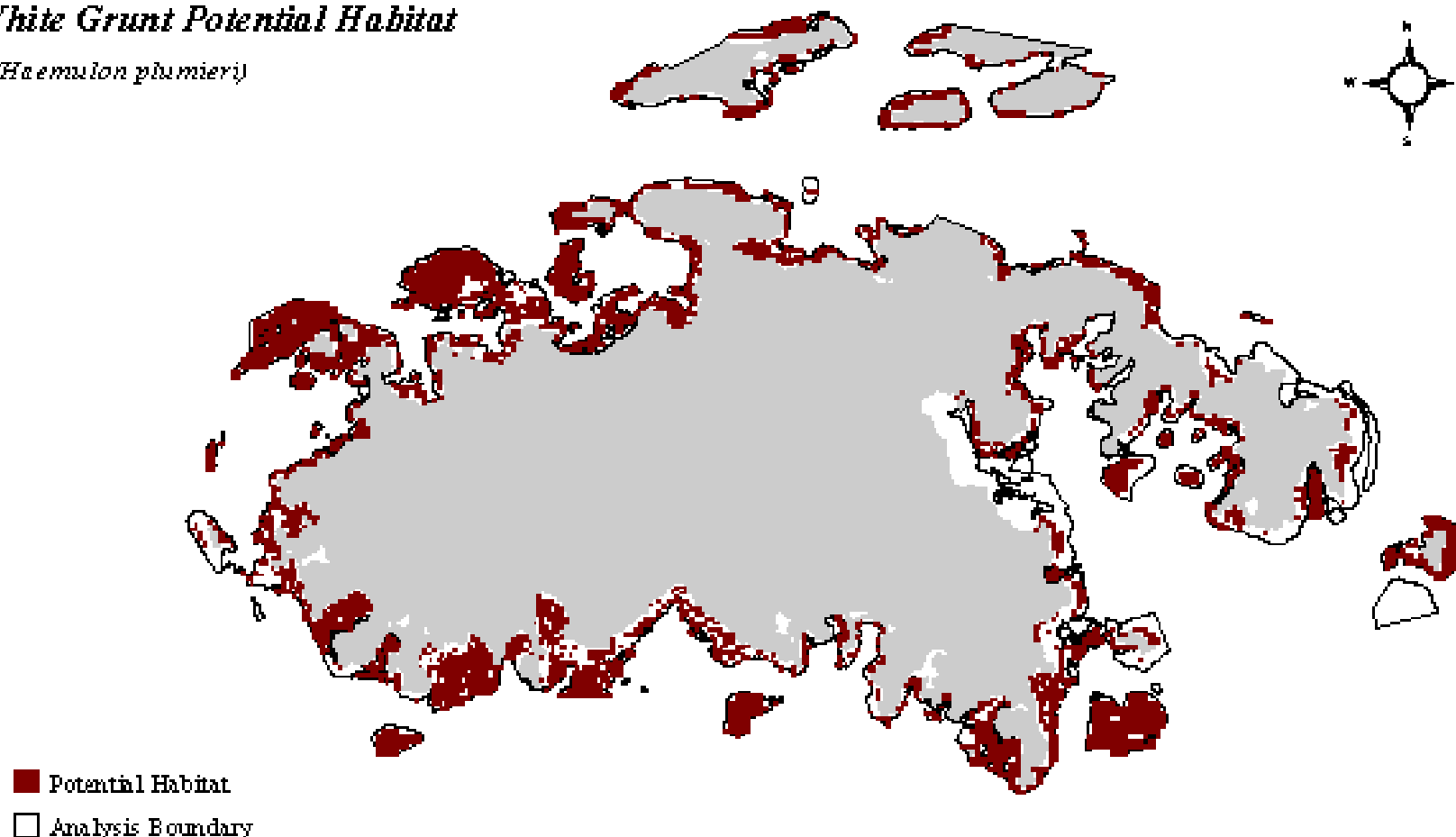


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Data Provided by Puerto Rico DNER  
and the National Marine Fisheries Service

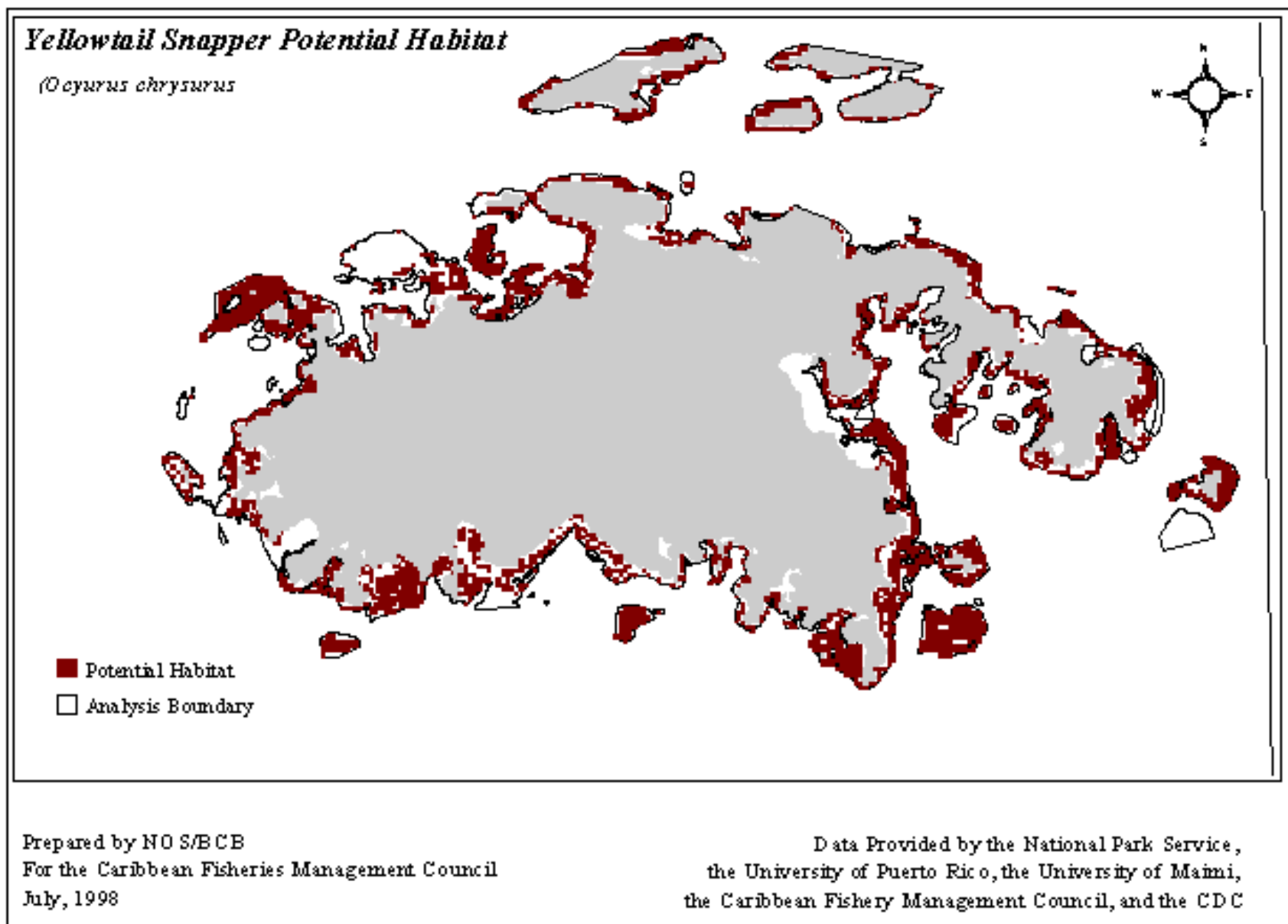
## *White Grunt Potential Habitat*

*(Haemulon plumieri)*



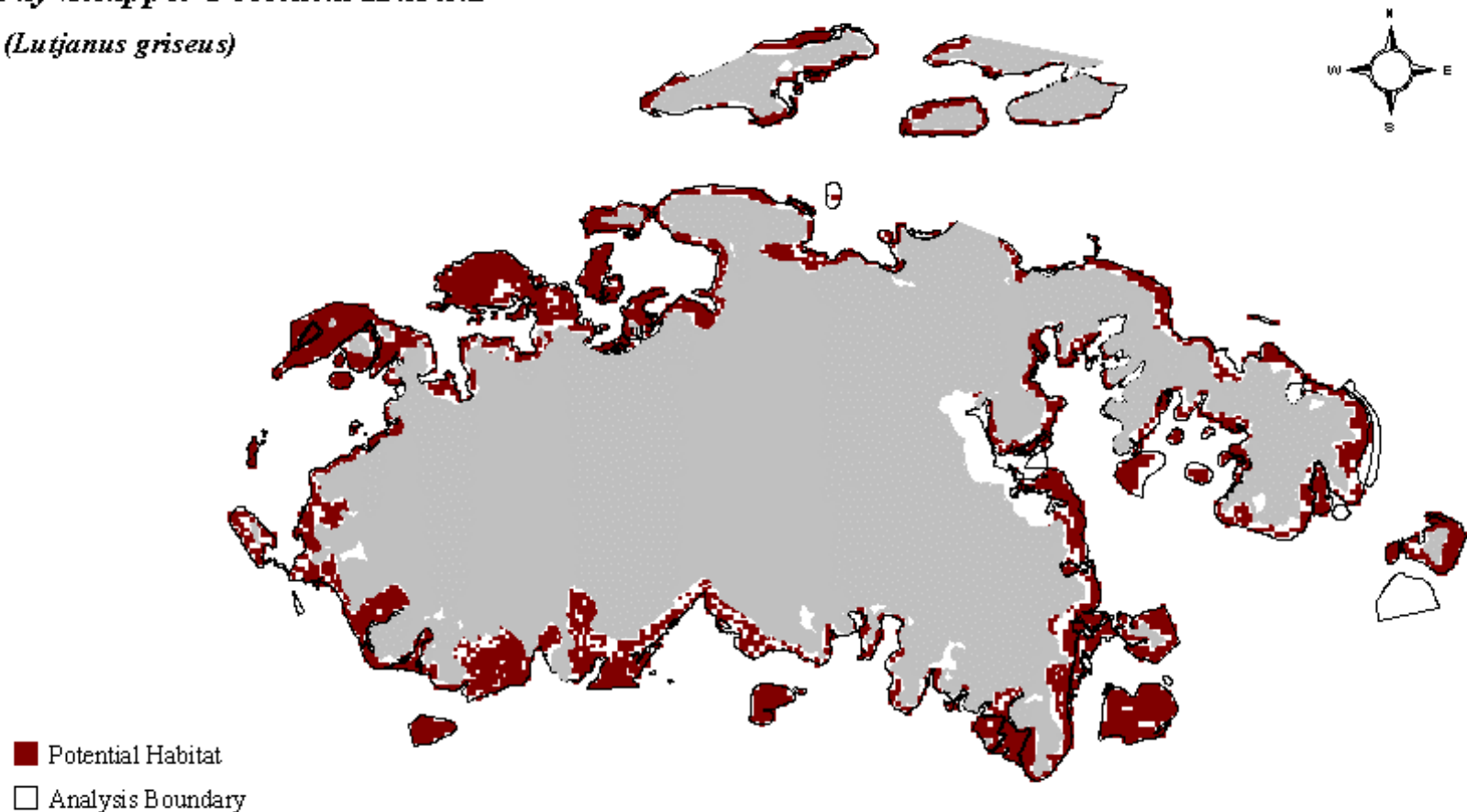
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the Caribbean Fishery Management Council, and the CDC



## ***Gray Snapper Potential Habitat***

*(Lutjanus griseus)*



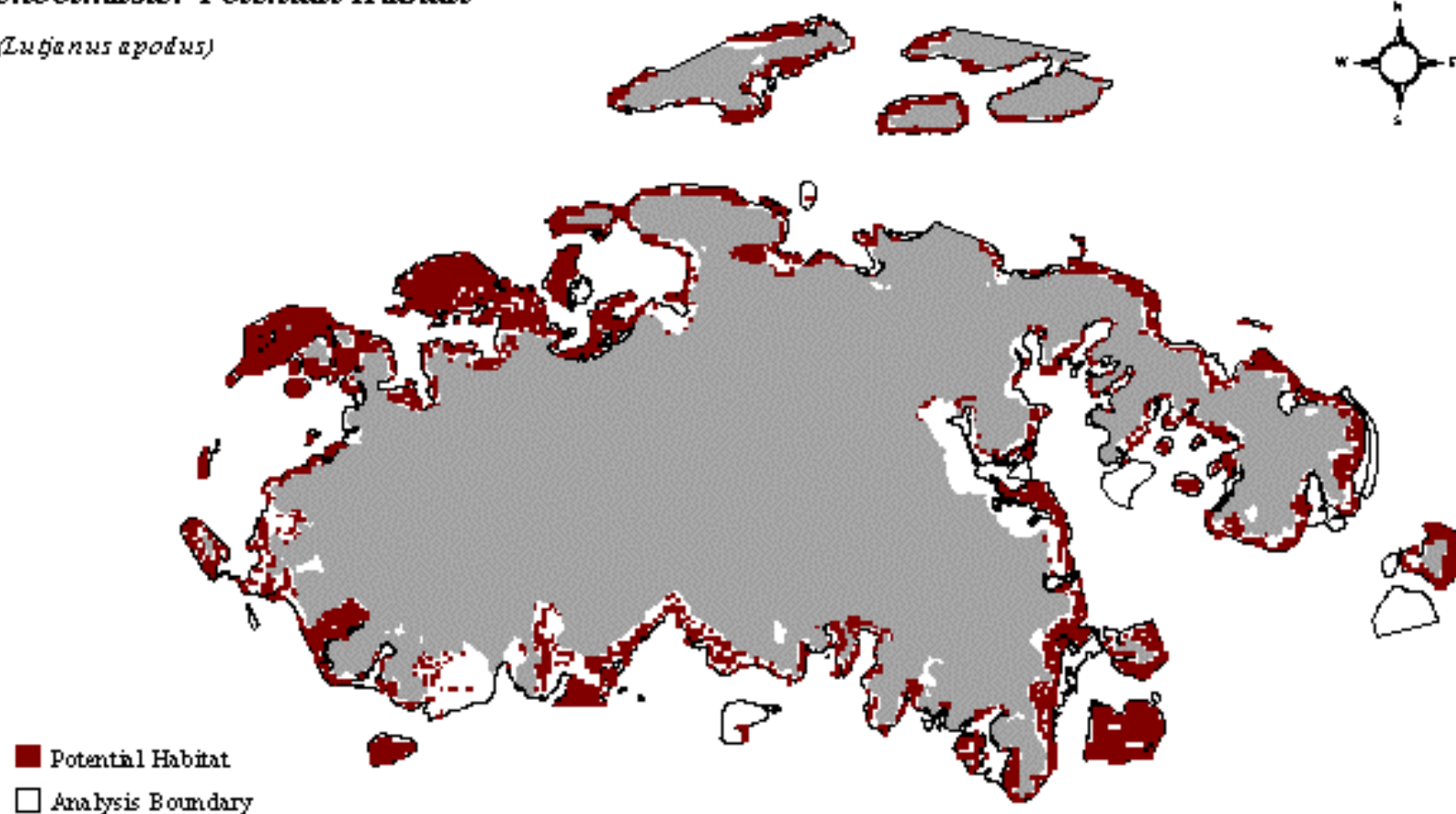
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### *Schoolmaster Potential Habitat*

*(Lugjanus apodus)*



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## *Mutton Snapper Potential Habitat*

*(Lutjanus analis)*

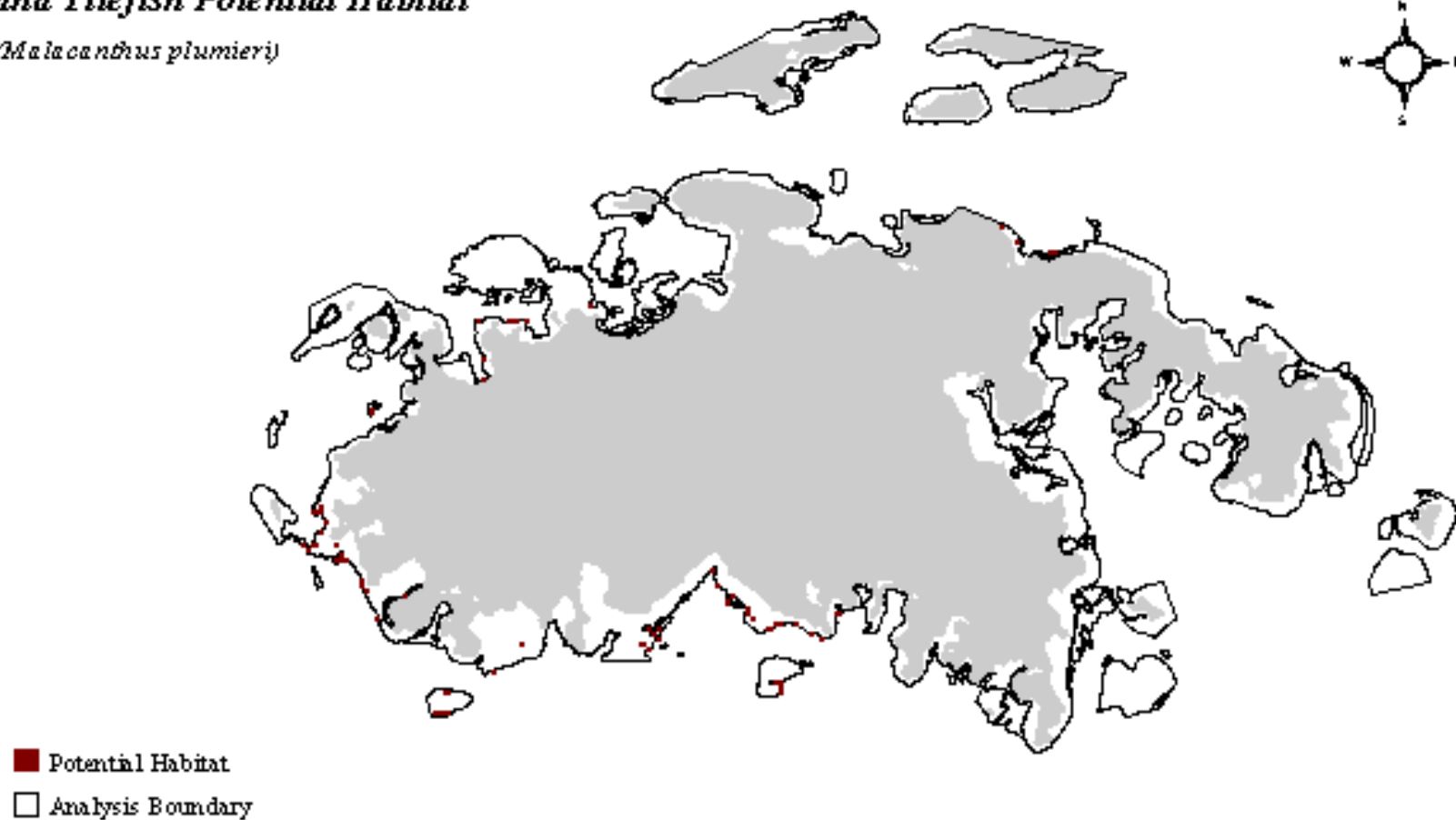


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## *Sand Tilefish Potential Habitat*

*(Malacanthus plumieri)*



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### *Nassau Grouper Potential Habitat*

*(Epinephelus striatus)*

- Potential Habitat
- Analysis Boundary

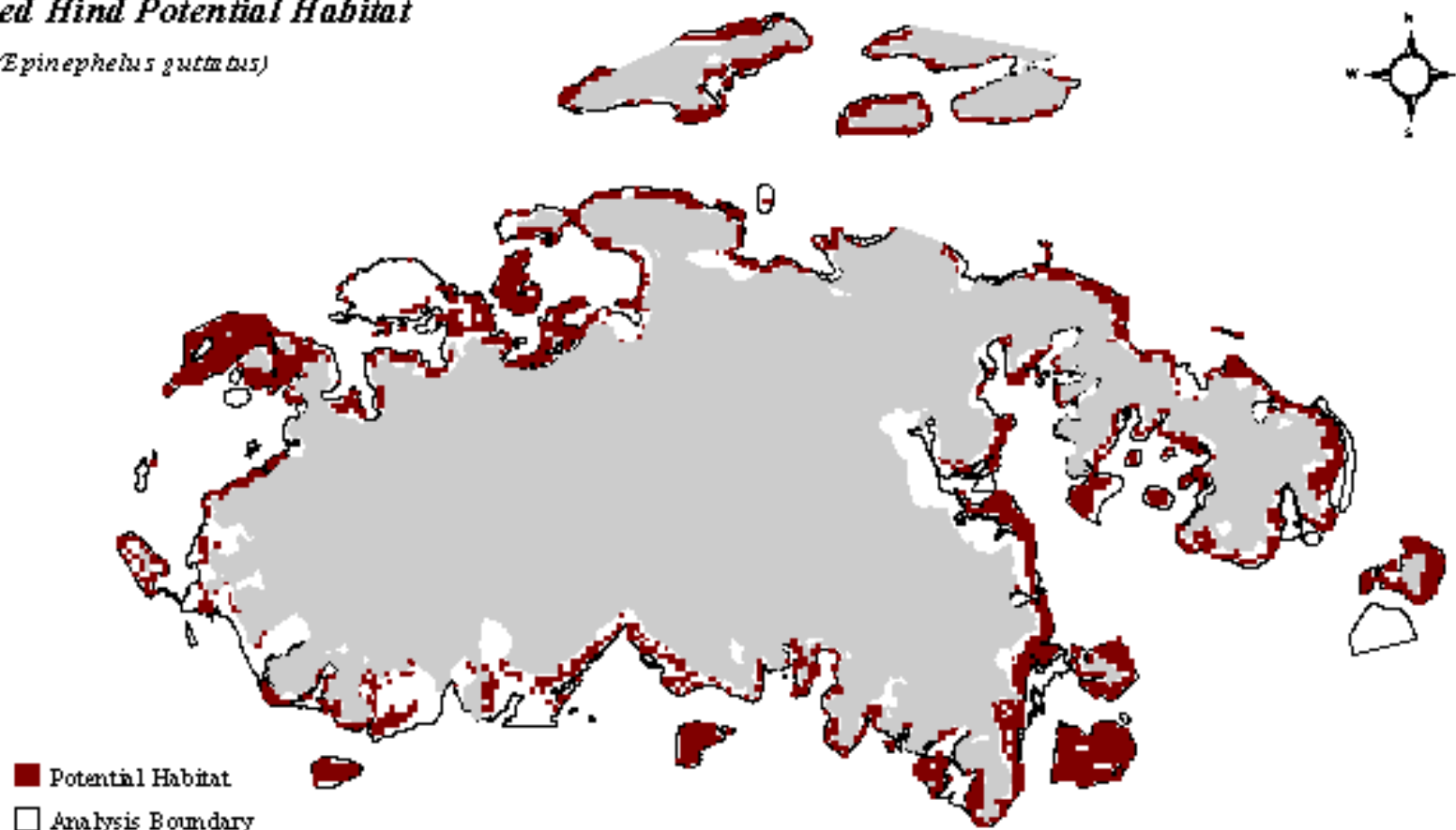


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### ***Red Hind Potential Habitat***

*(Epinephelus guttatus)*

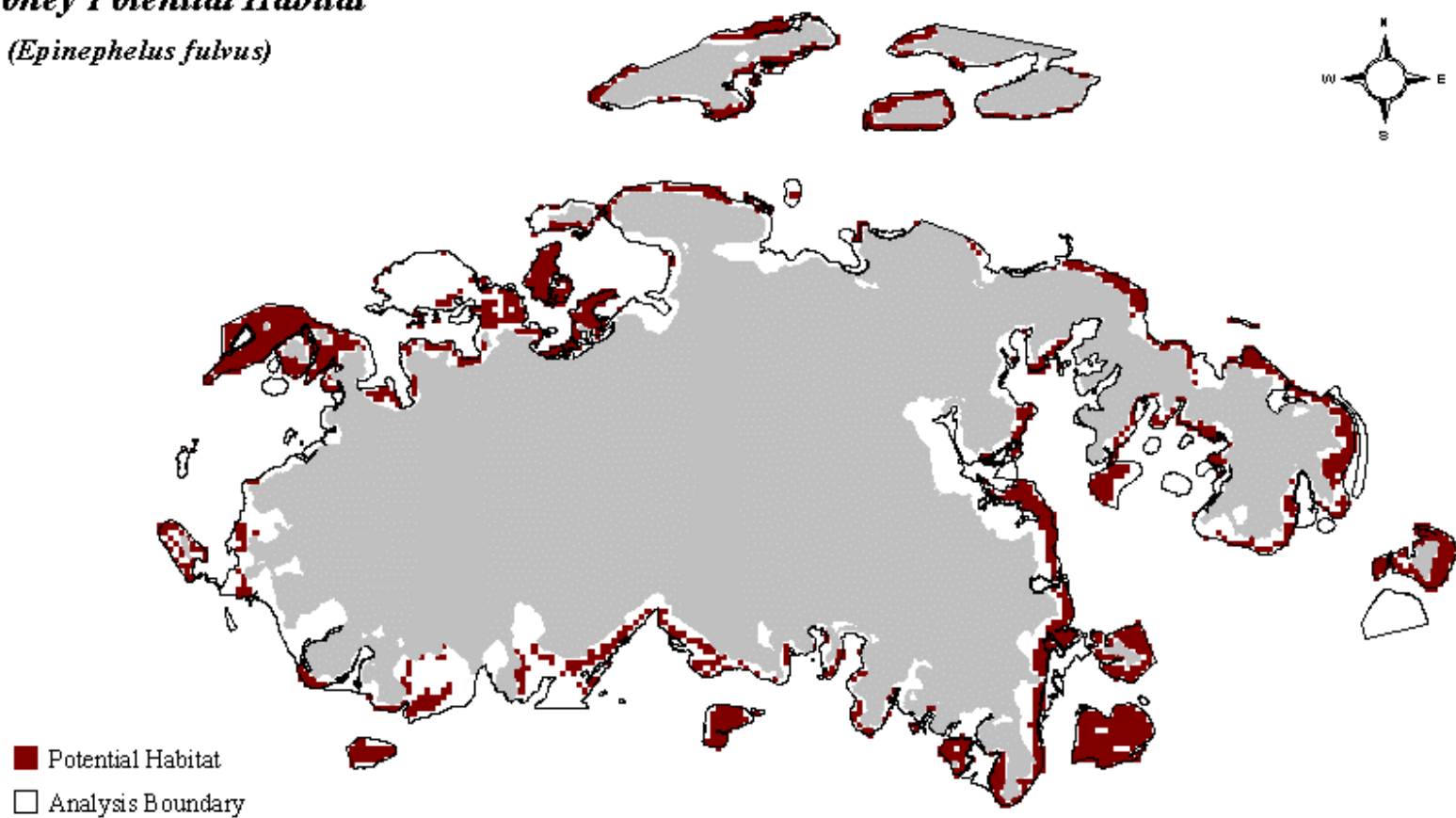


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### ***Coney Potential Habitat***

*(Epinephelus fulvus)*

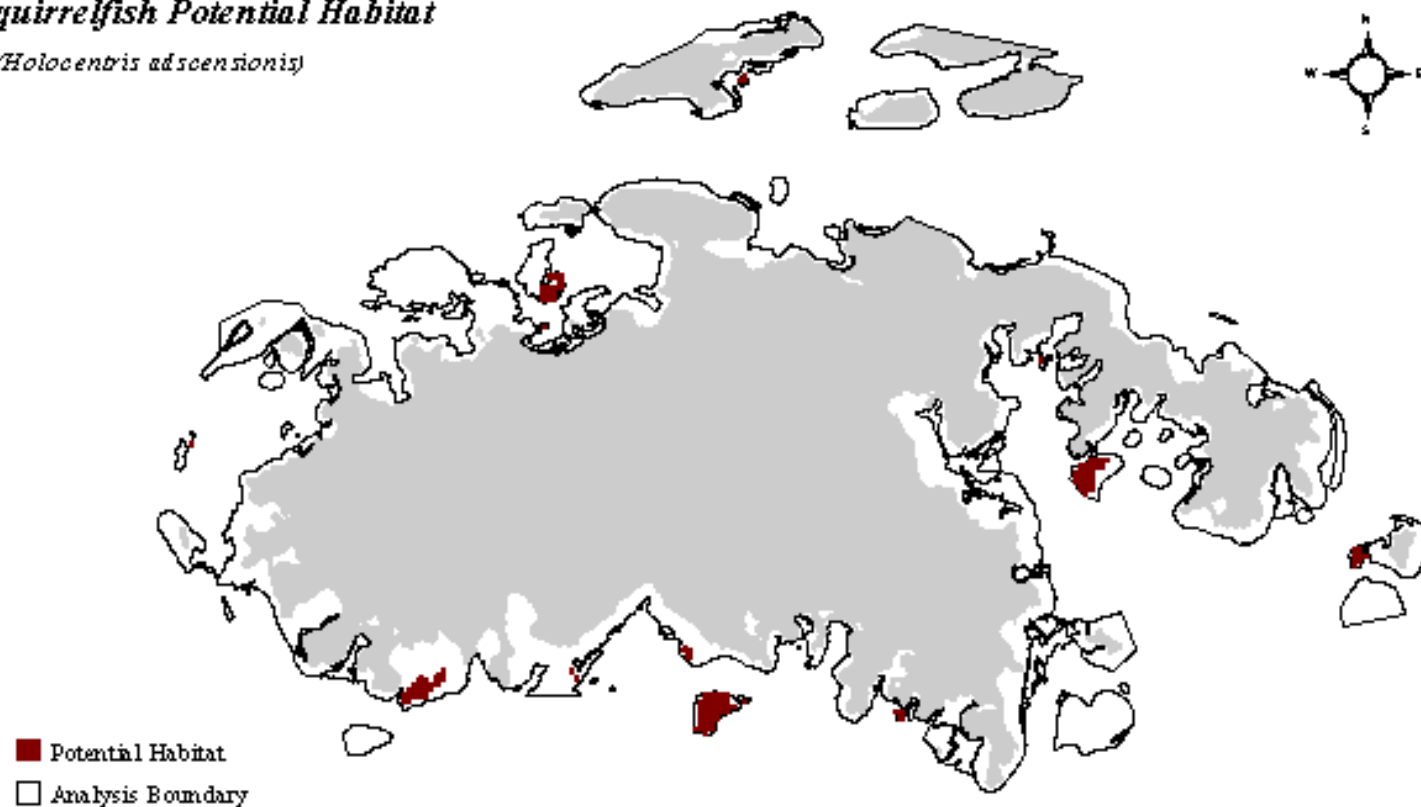


Prepared by NOAA/BCB  
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Data Provided by the National Park Service,  
the University of Puerto Rico, the University of Maimi,  
the Caribbean Fishery Management Council, and the CDC

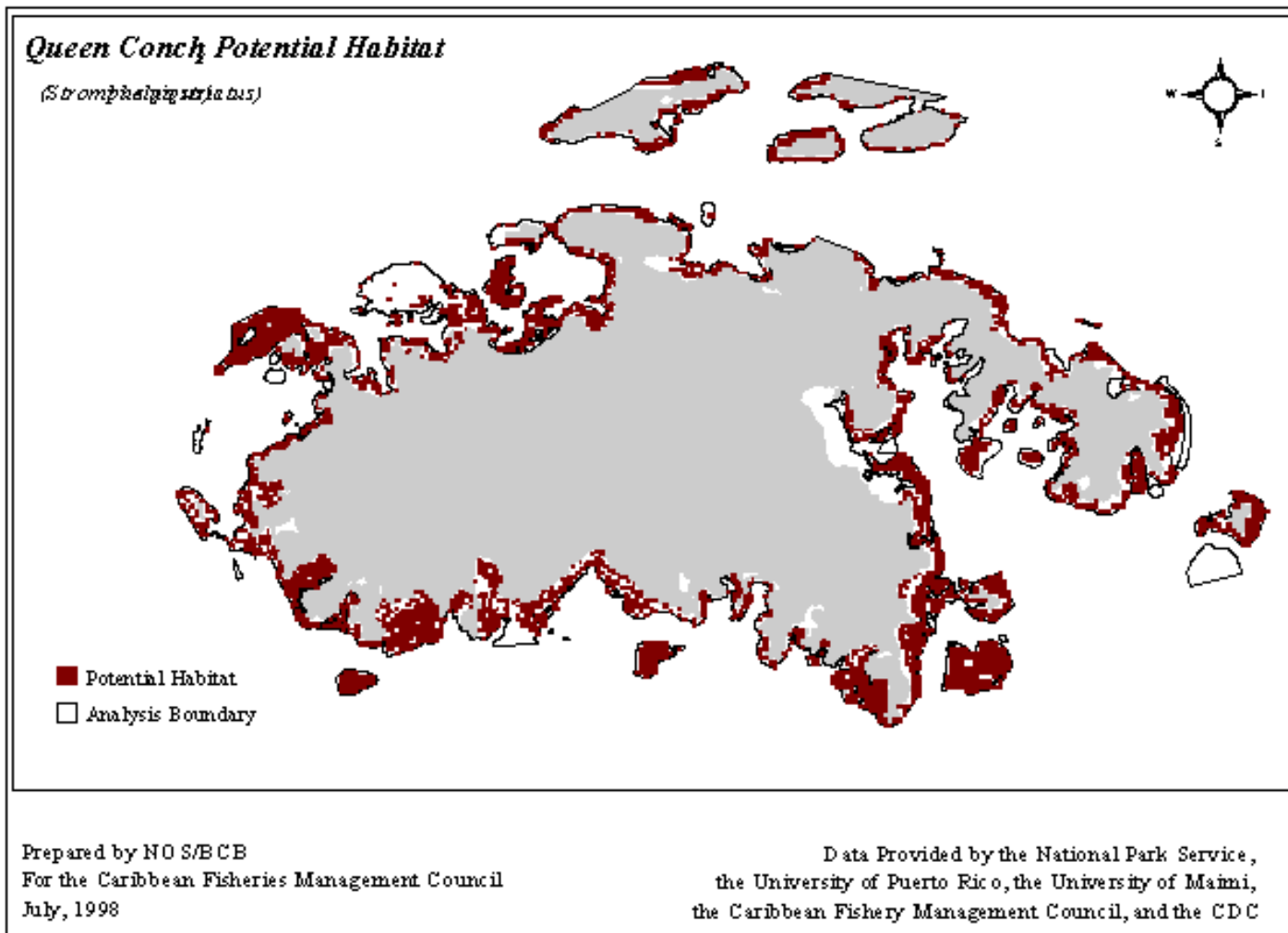
### ***Squirrelfish Potential Habitat***

*(Holocentris adscensionis)*

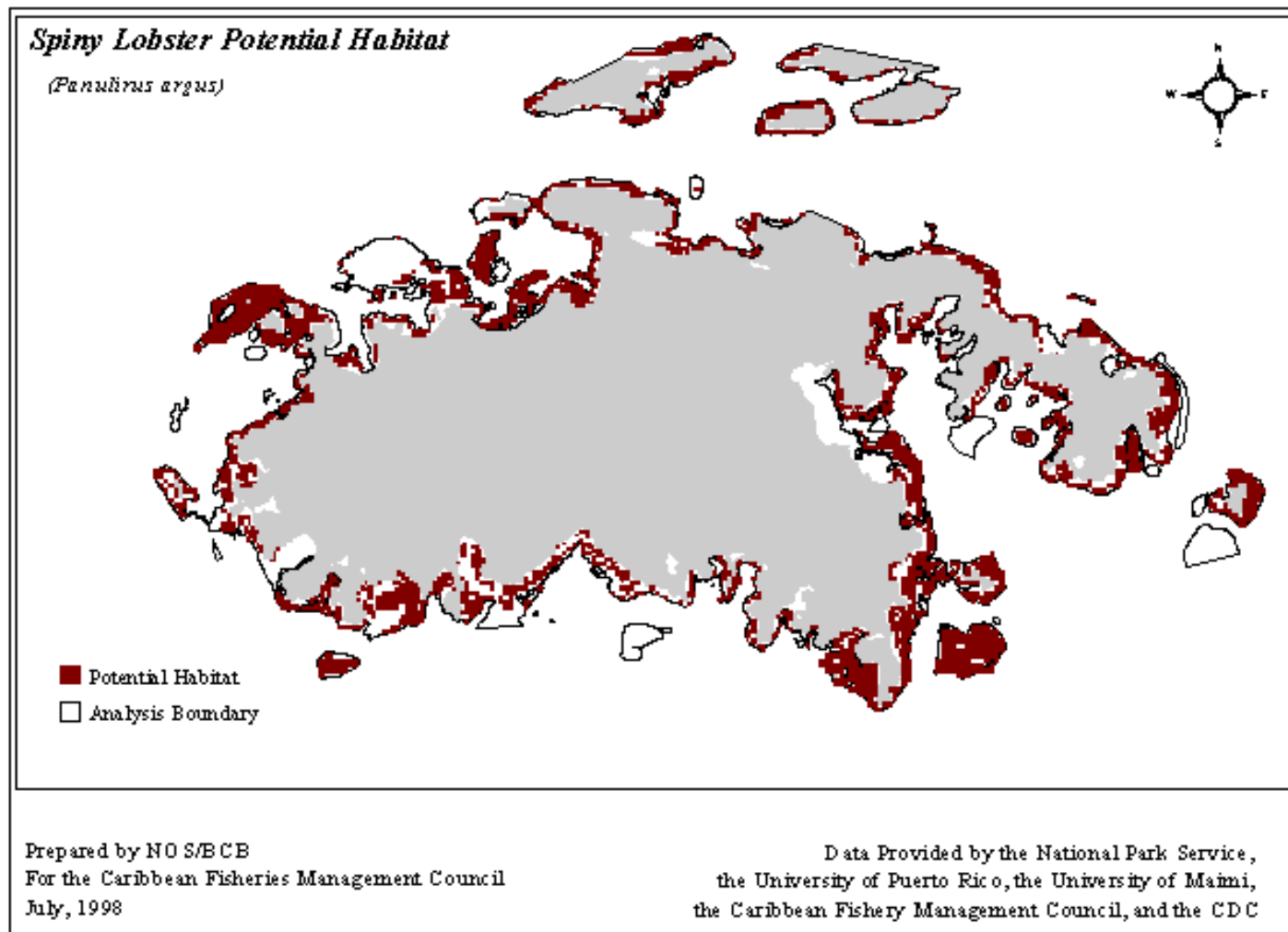


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the Caribbean Fishery Management Council, and the CDC

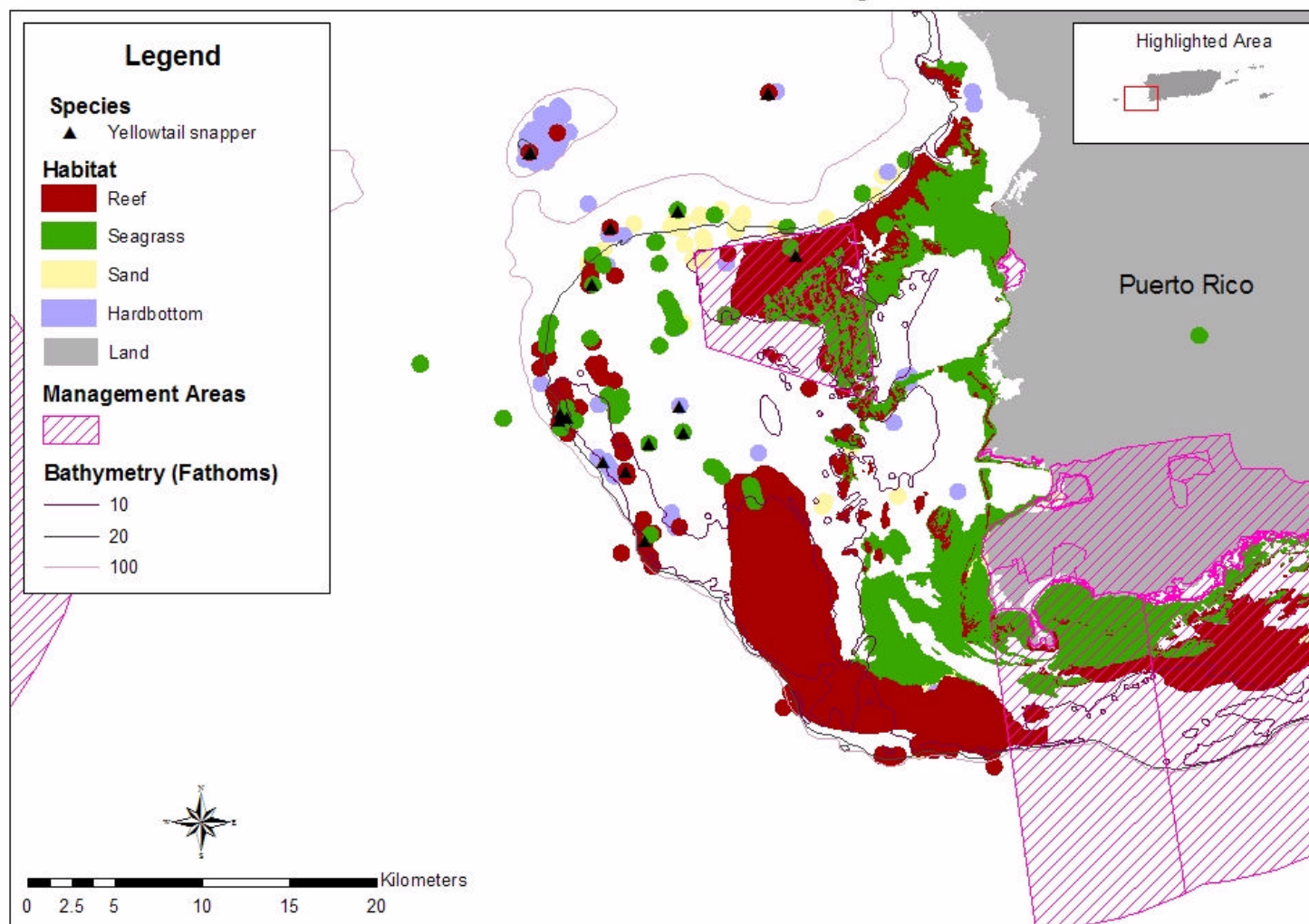




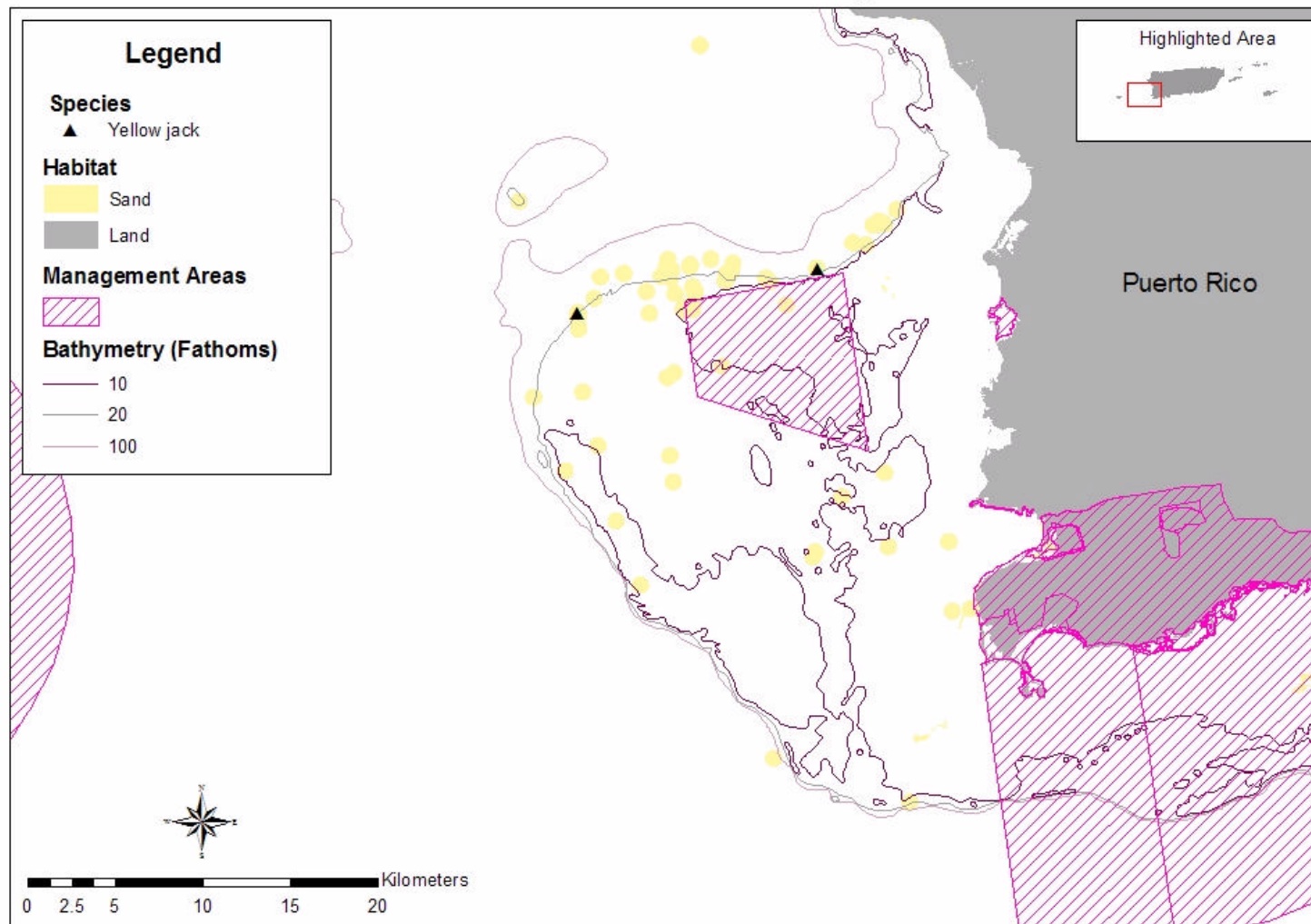


Appendix 3. Locations of Running Ripe fish for selected species off Southwestern Puerto Rico  
(from NOAA SEAMAP data)

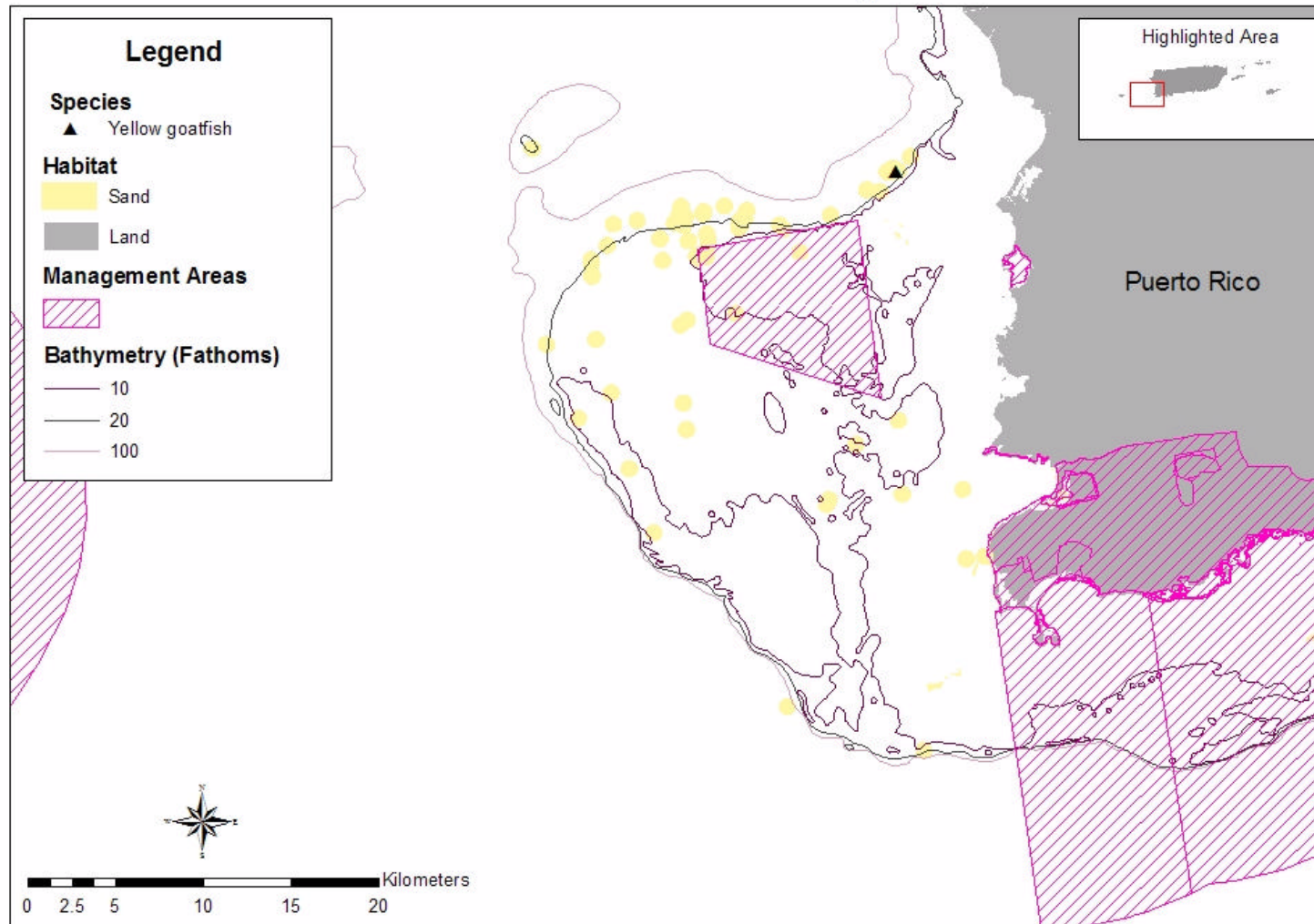
# Yellowtail snapper (*Ocyurus chrysurus*) - Running Ripe Puerto Rico: Southwest Coast Region



# Yellow jack (*Caranx bartholomaei*) - Running Ripe Puerto Rico: Southwest Coast Region



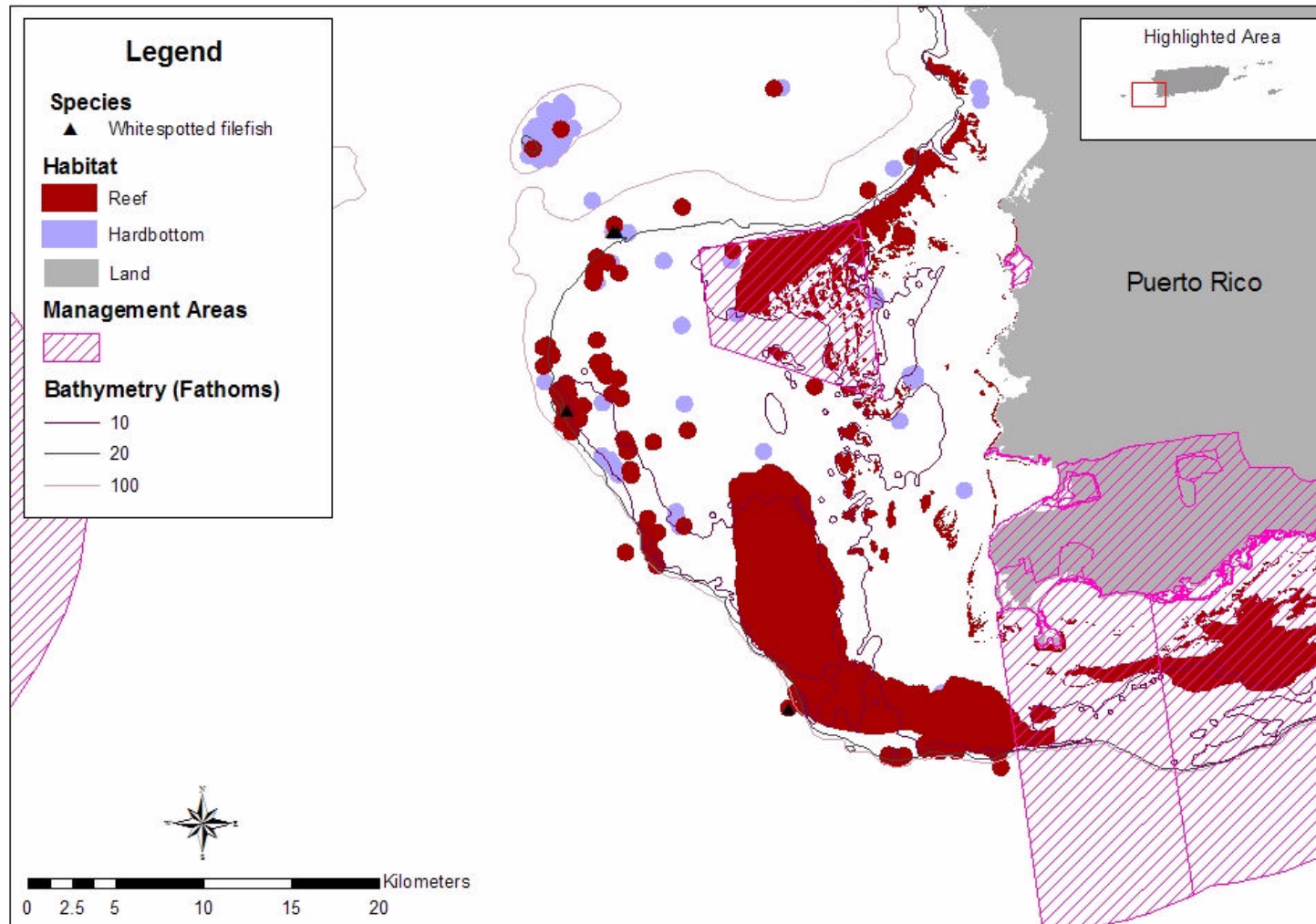
Yellow goatfish (*Mulloidichthys martinicus*) - Running Ripe  
Puerto Rico: Southwest Coast Region



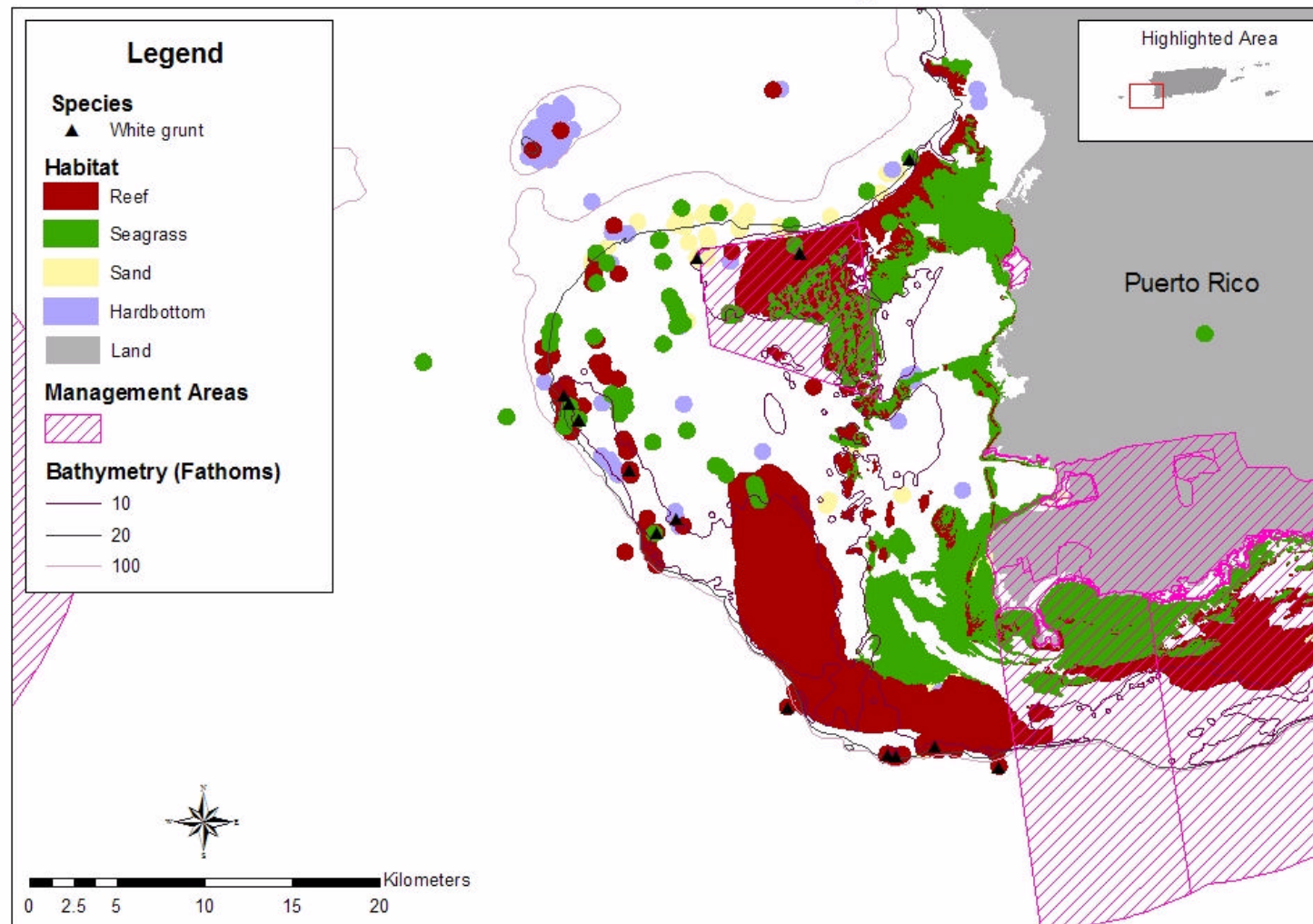


# Whitespotted filefish (*Cantherhines macrocerus*) - Running Ripe

## Puerto Rico: Southwest Coast Region

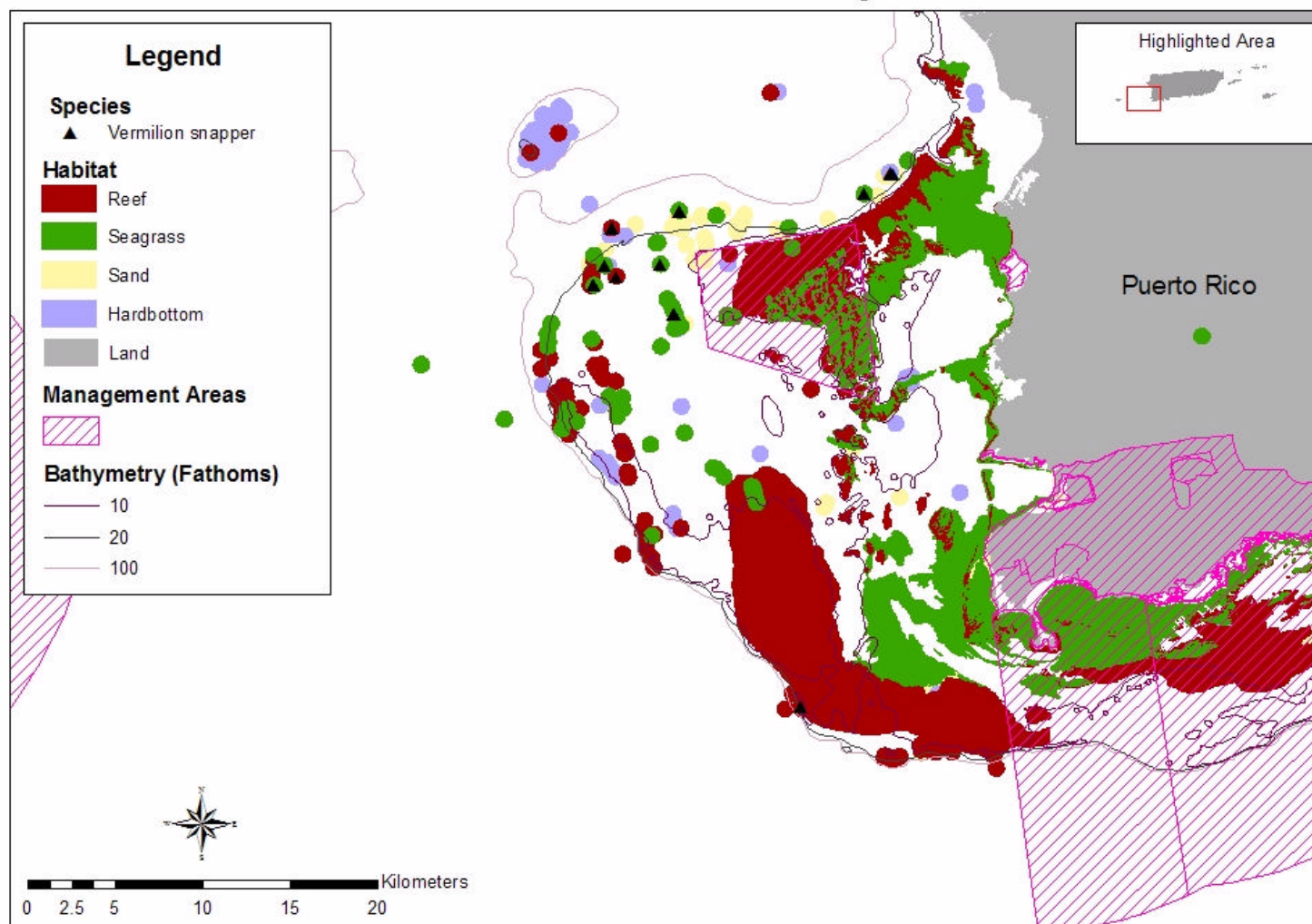


# White grunt (*Haemulon plumieri*) - Running Ripe Puerto Rico: Southwest Coast Region



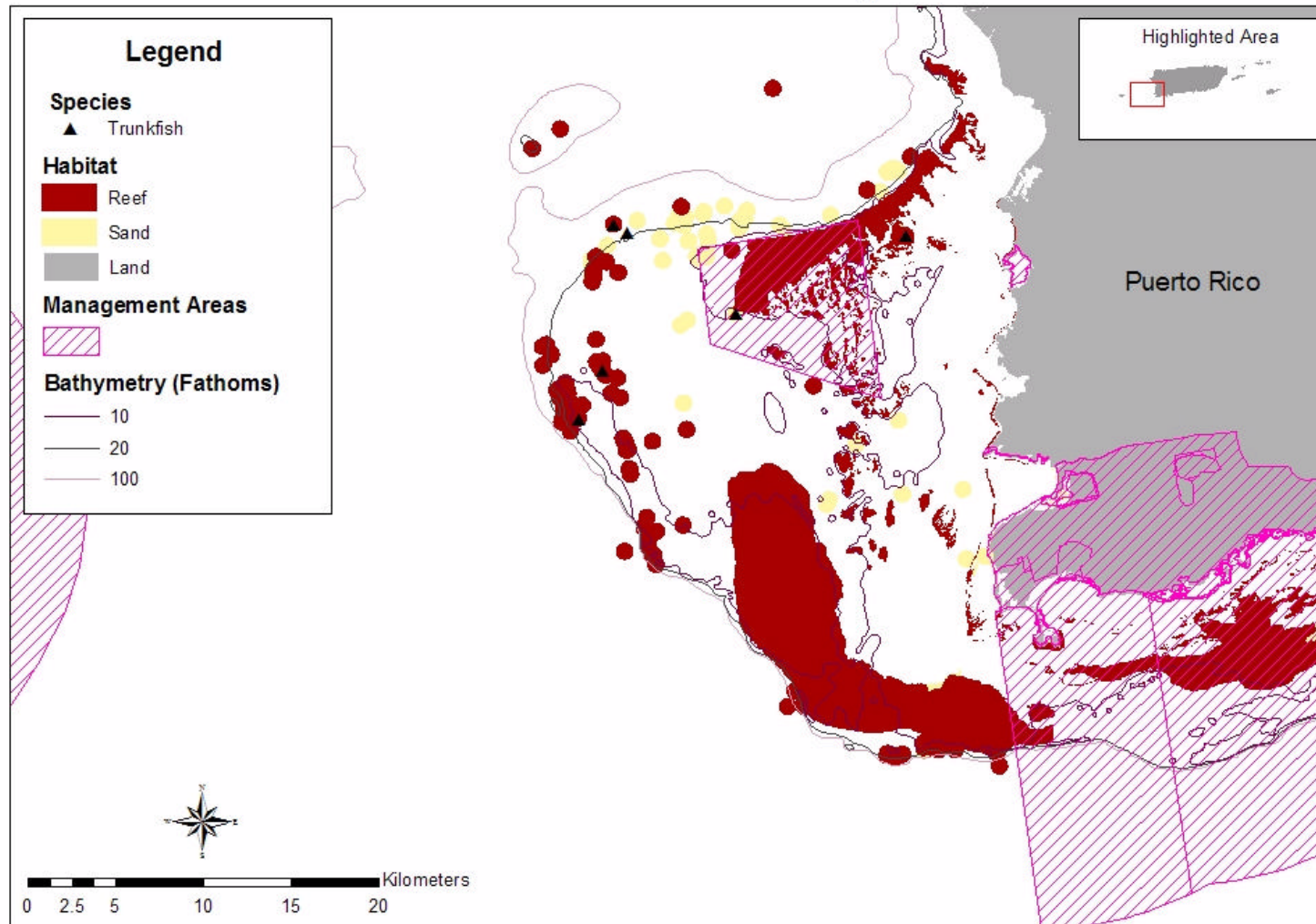
# Vermilion snapper (*Rhomboplites aurorubens*) - Running Ripe

## Puerto Rico: Southwest Coast Region

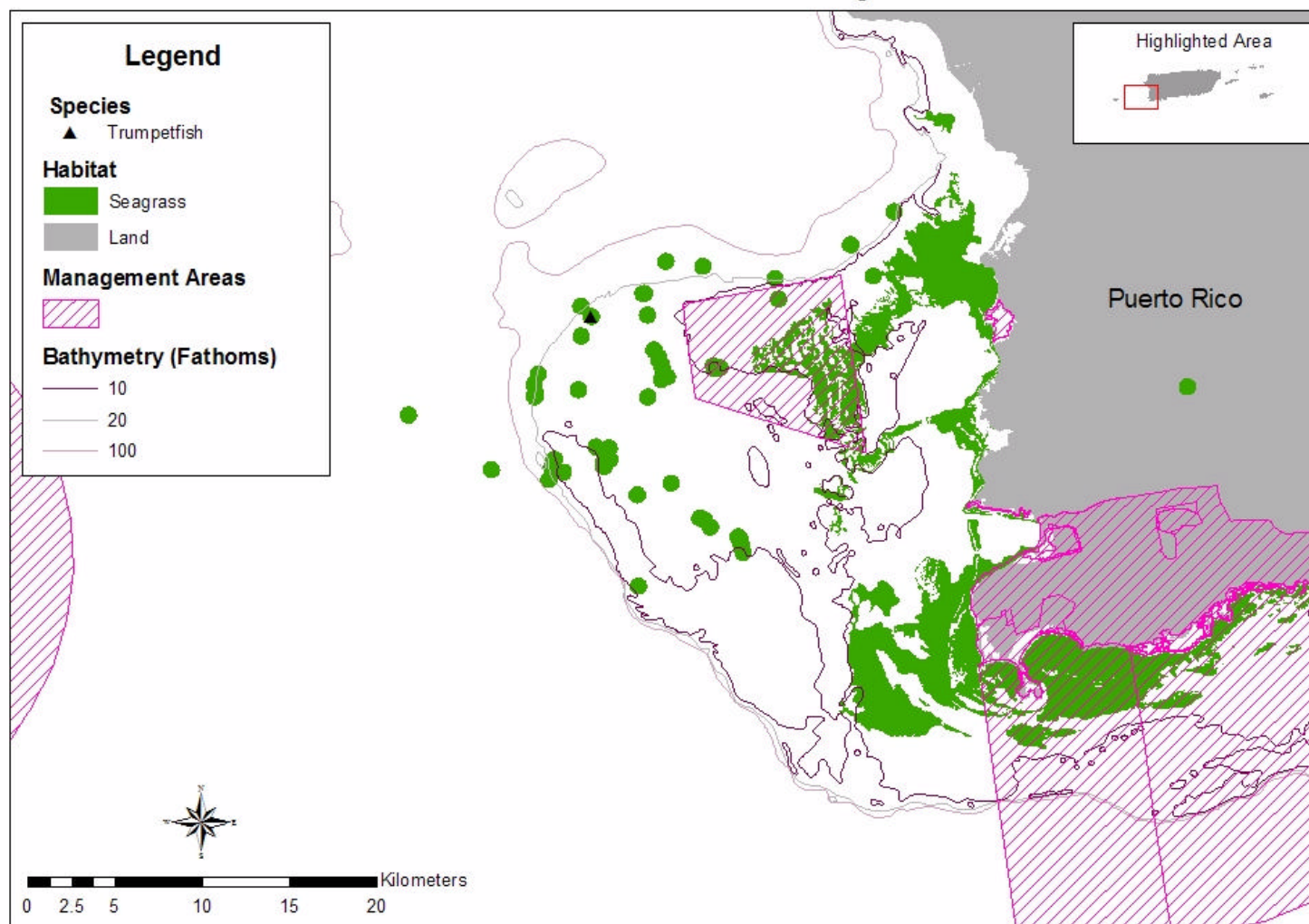




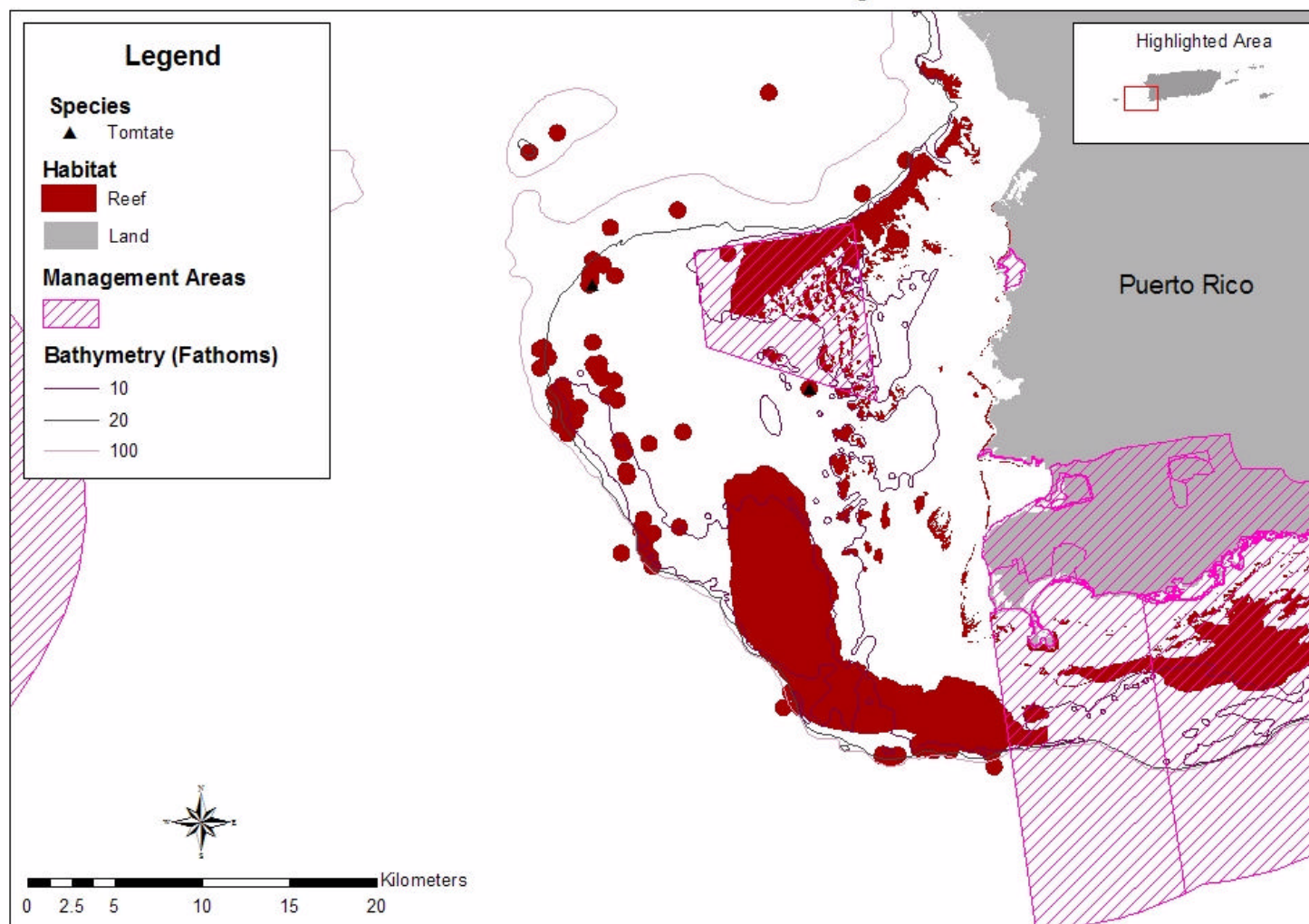
# Trunkfish (*Lactophrys trigonus*) - Running Ripe Puerto Rico: Southwest Coast Region



# Trumpetfish (*Aulostomus maculatus*) - Running Ripe Puerto Rico: Southwest Coast Region

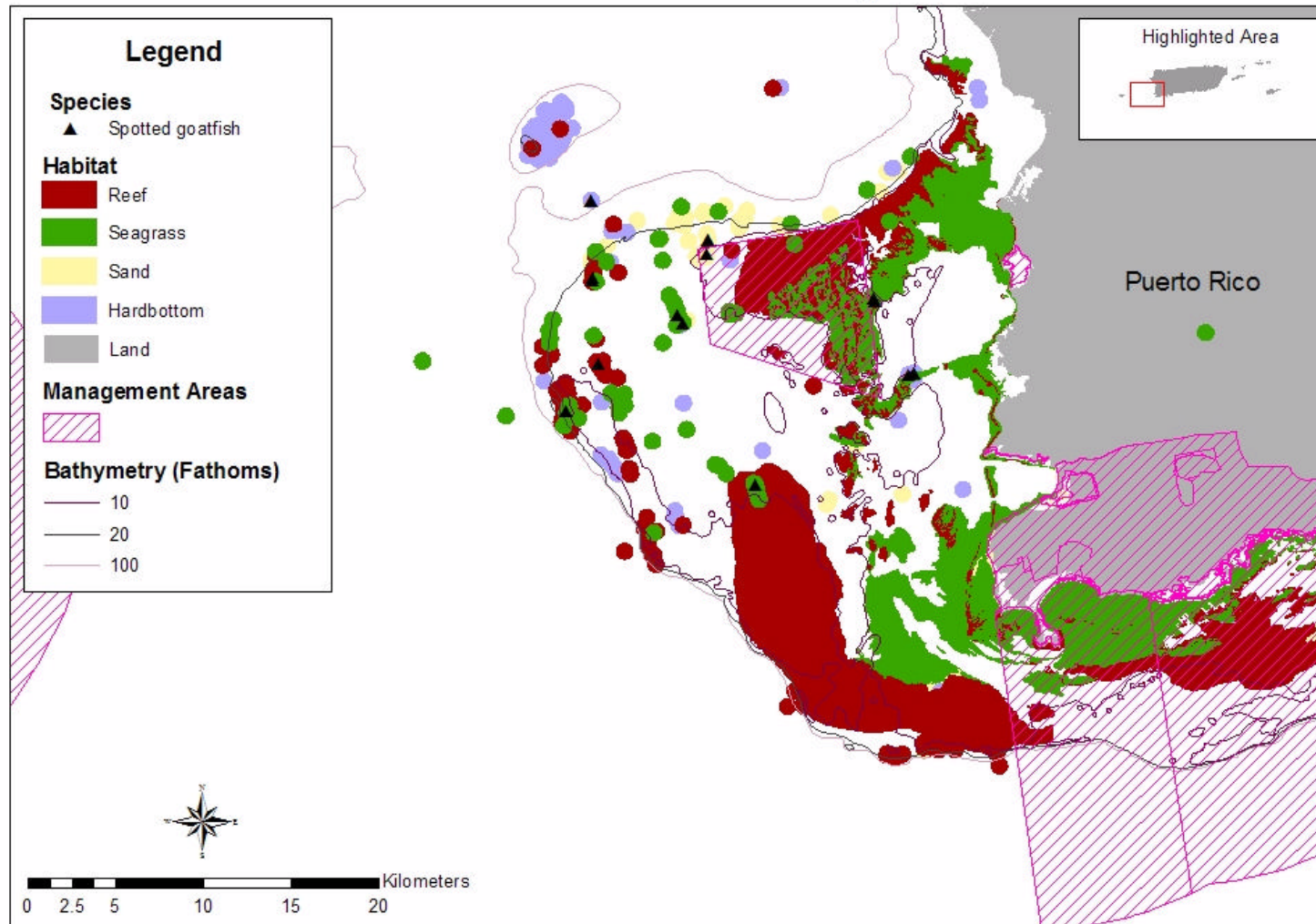


Tomtate (*Haemulon aurolineatum*) - Running Ripe  
Puerto Rico: Southwest Coast Region

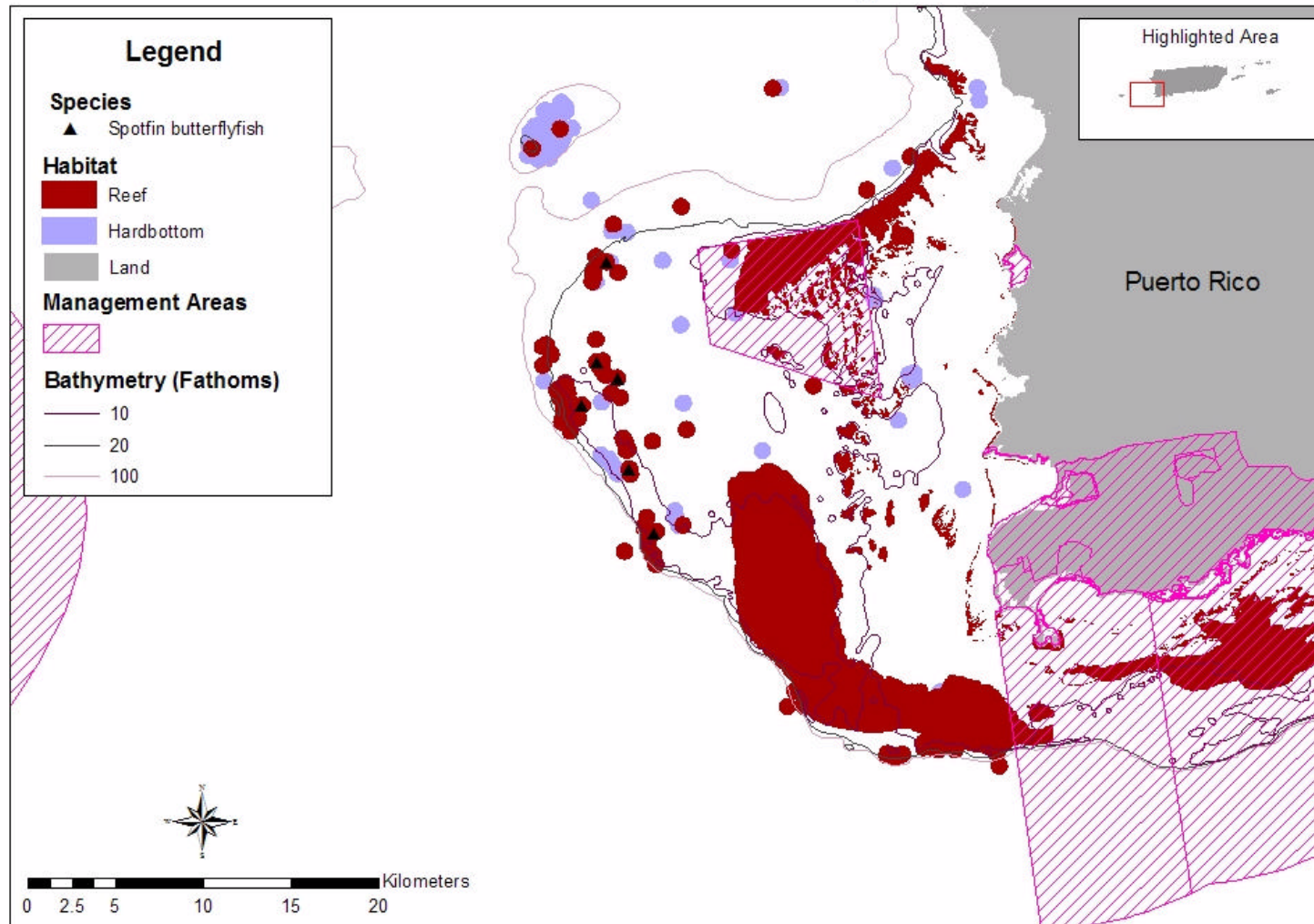




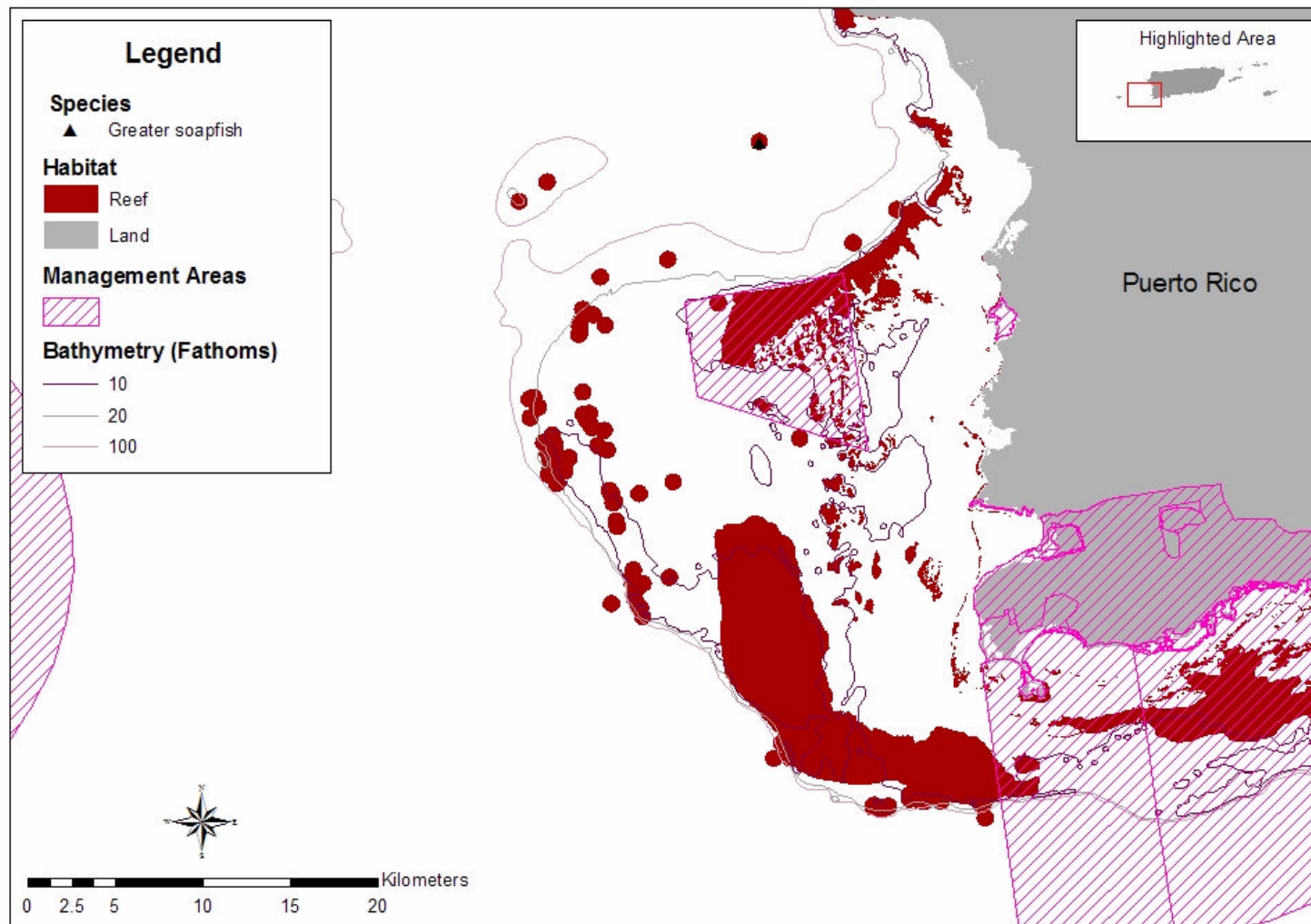
# Spotted goatfish (*Pseudupeneus maculatus*) - Running Ripe Puerto Rico: Southwest Coast Region



Spotfin butterflyfish (*Chaetodon ocellatus*) - Running Ripe  
Puerto Rico: Southwest Coast Region

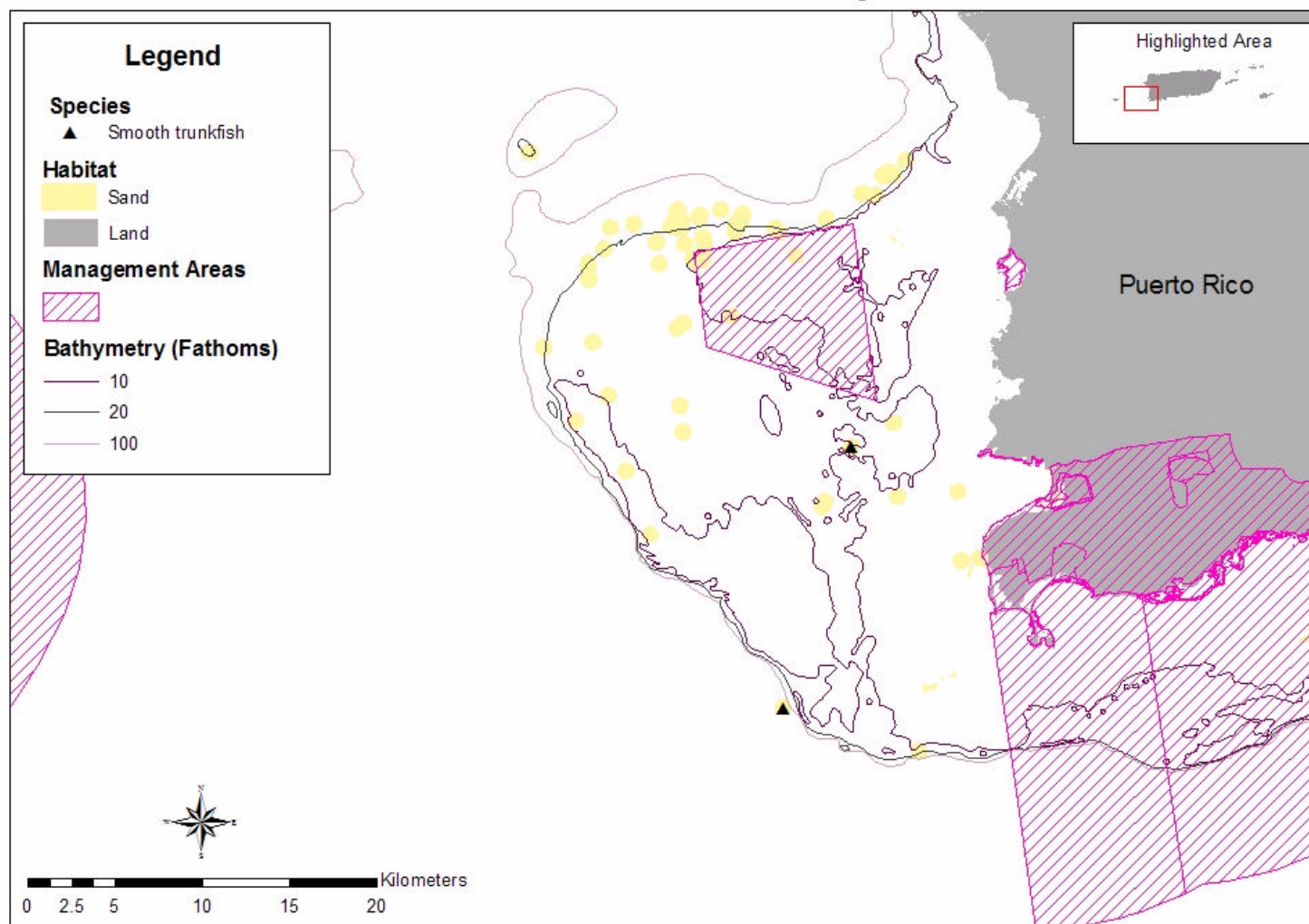


# Greater soapfish (*Rypticus saponaceus*) - Running Ripe Puerto Rico: Southwest Coast Region

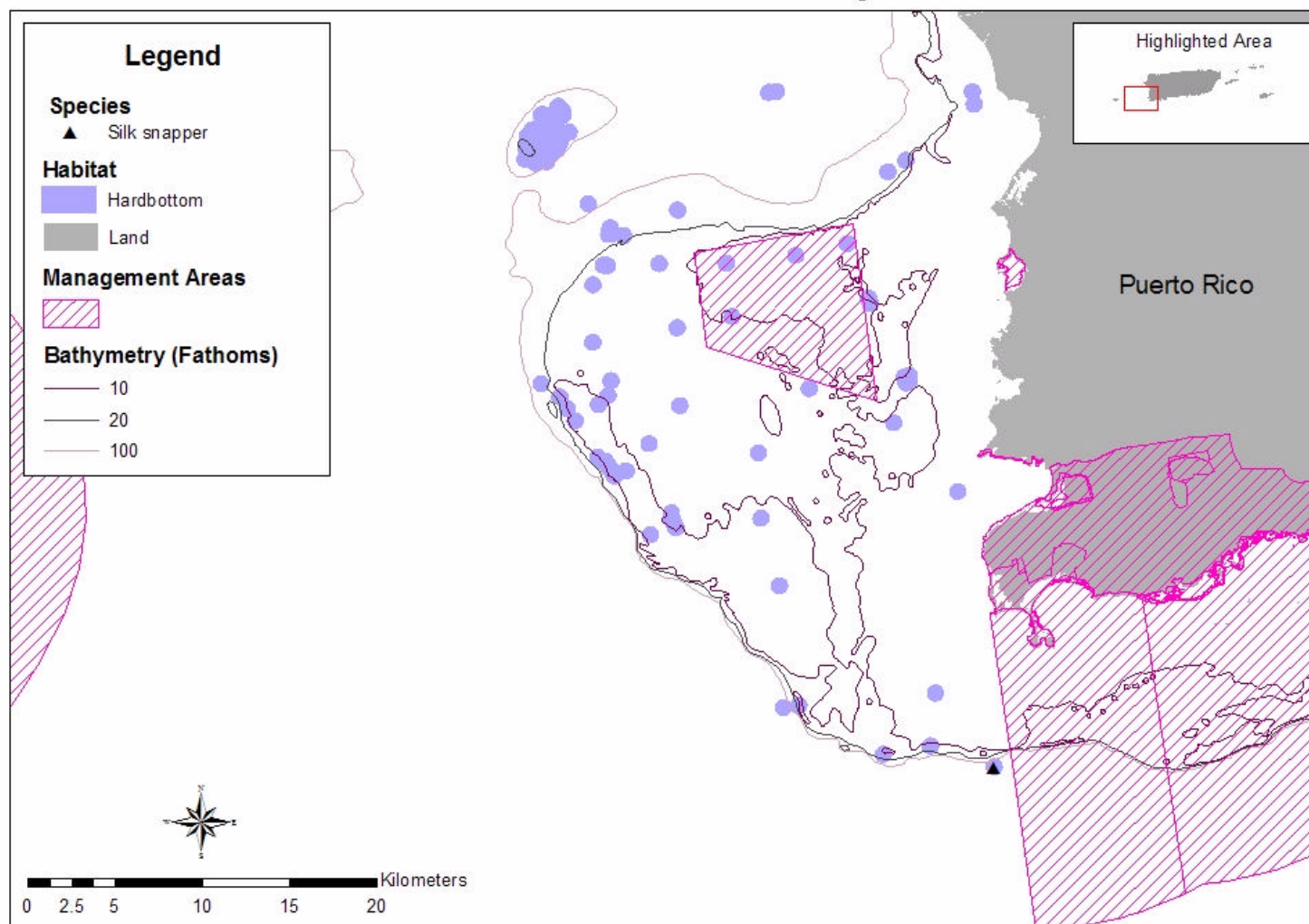




# Smooth trunkfish (*Lactophrys triqueter*) - Running Ripe Puerto Rico: Southwest Coast Region

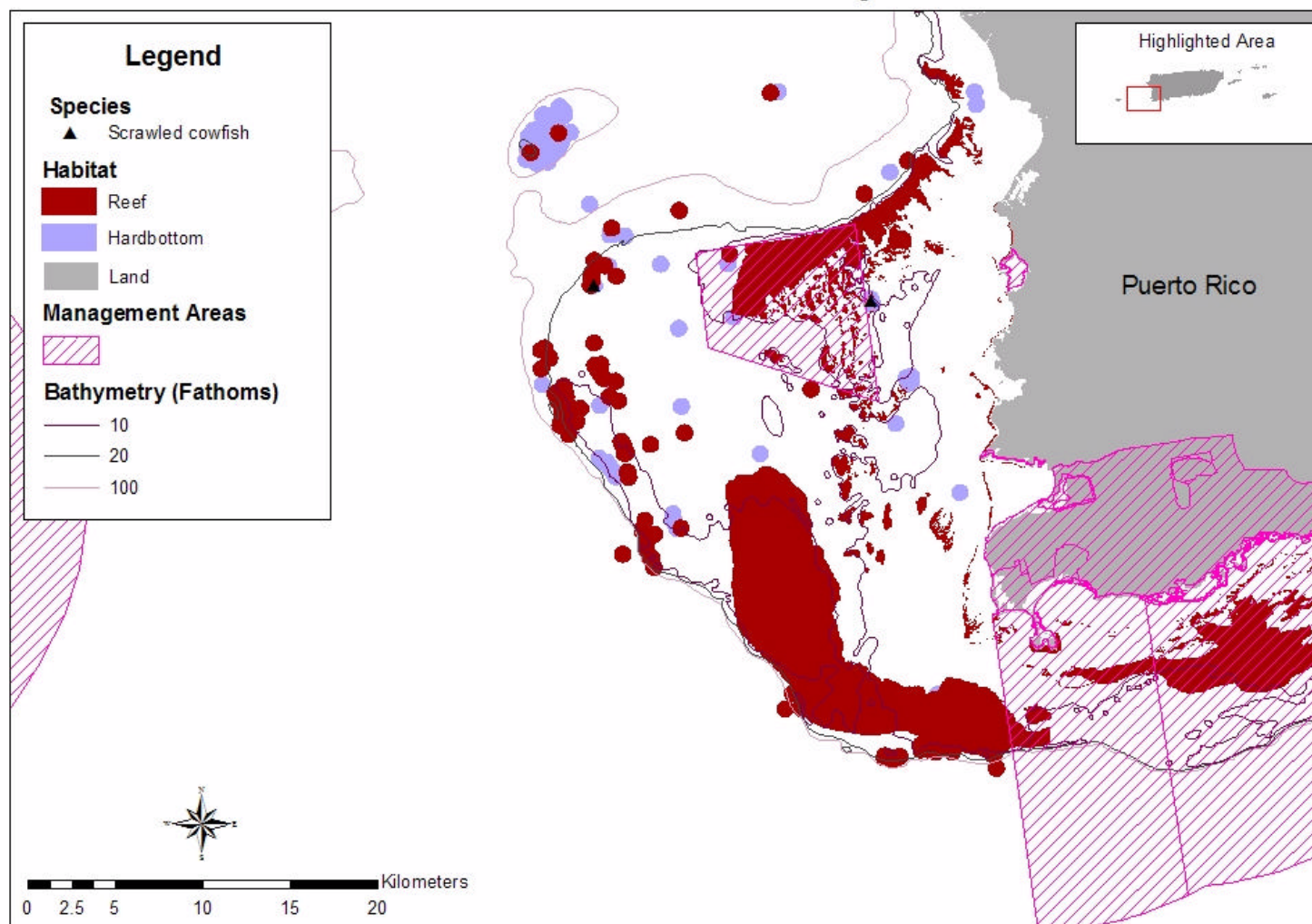


# Silk snapper (*Lutjanus vivanus*) - Running Ripe Puerto Rico: Southwest Coast Region



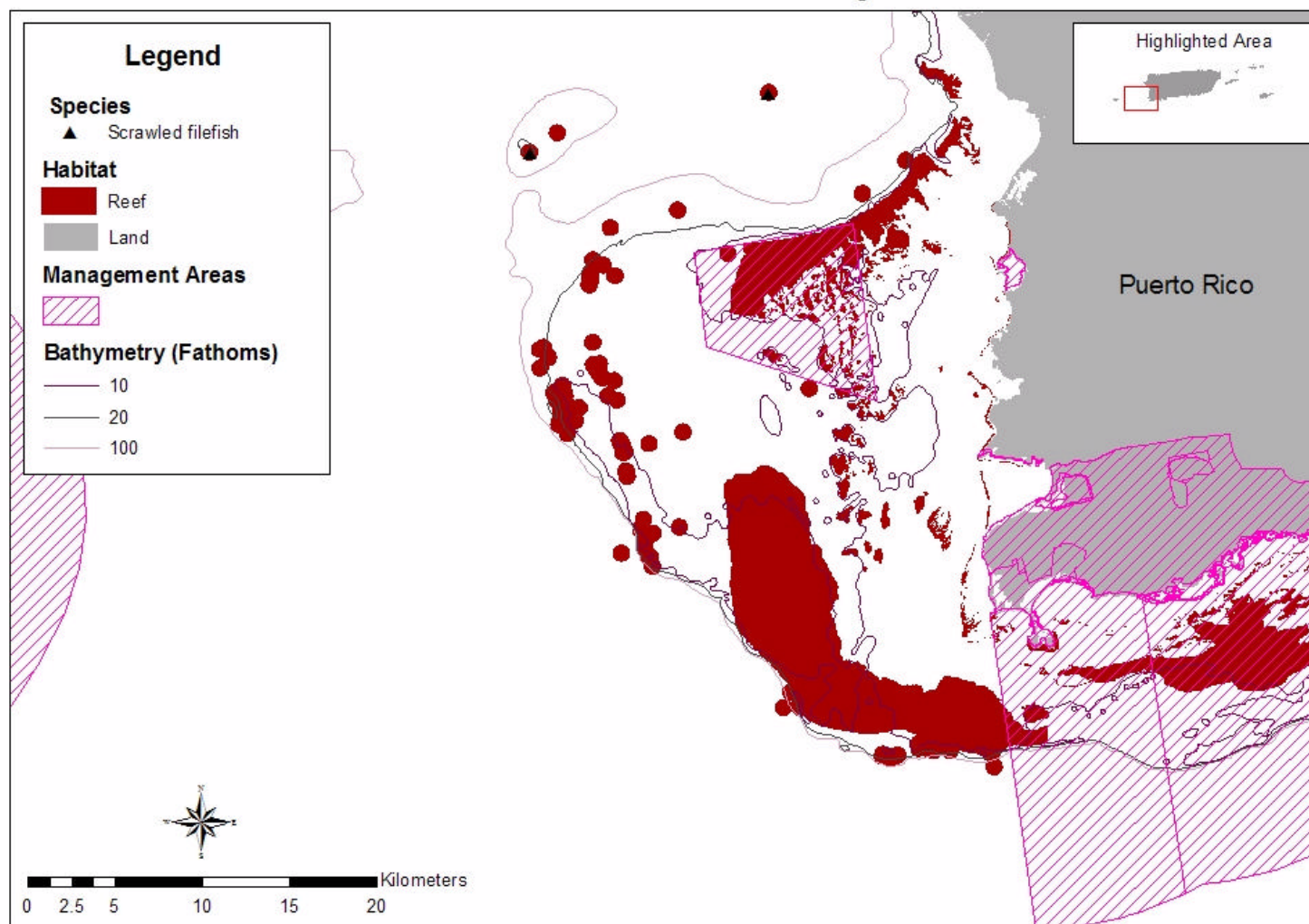


# Scrawled cowfish (*Lactophrys quadricornis*) - Running Ripe Puerto Rico: Southwest Coast Region



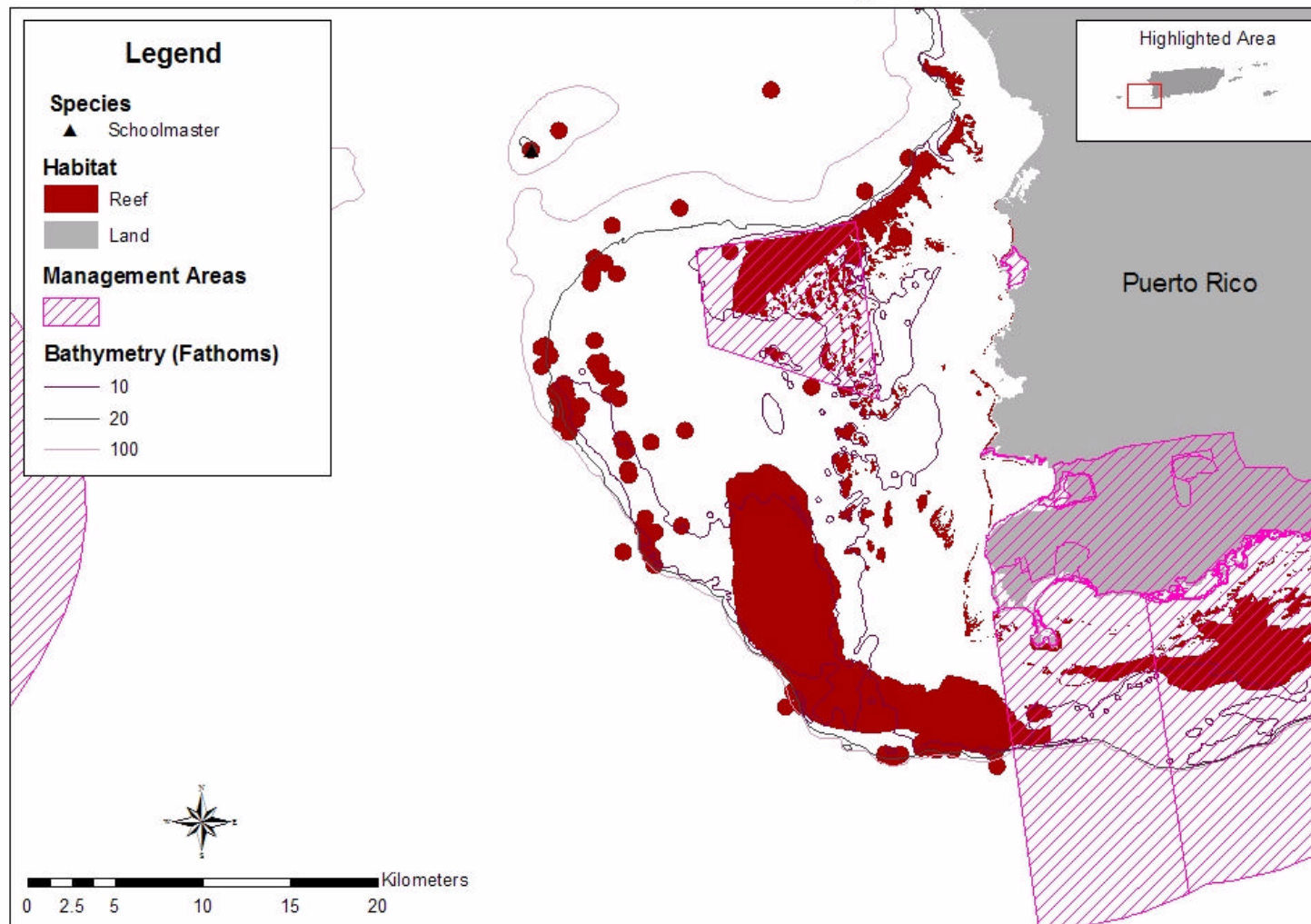
# Scrawled filefish (*Aluterus scriptus*) - Running Ripe

## Puerto Rico: Southwest Coast Region



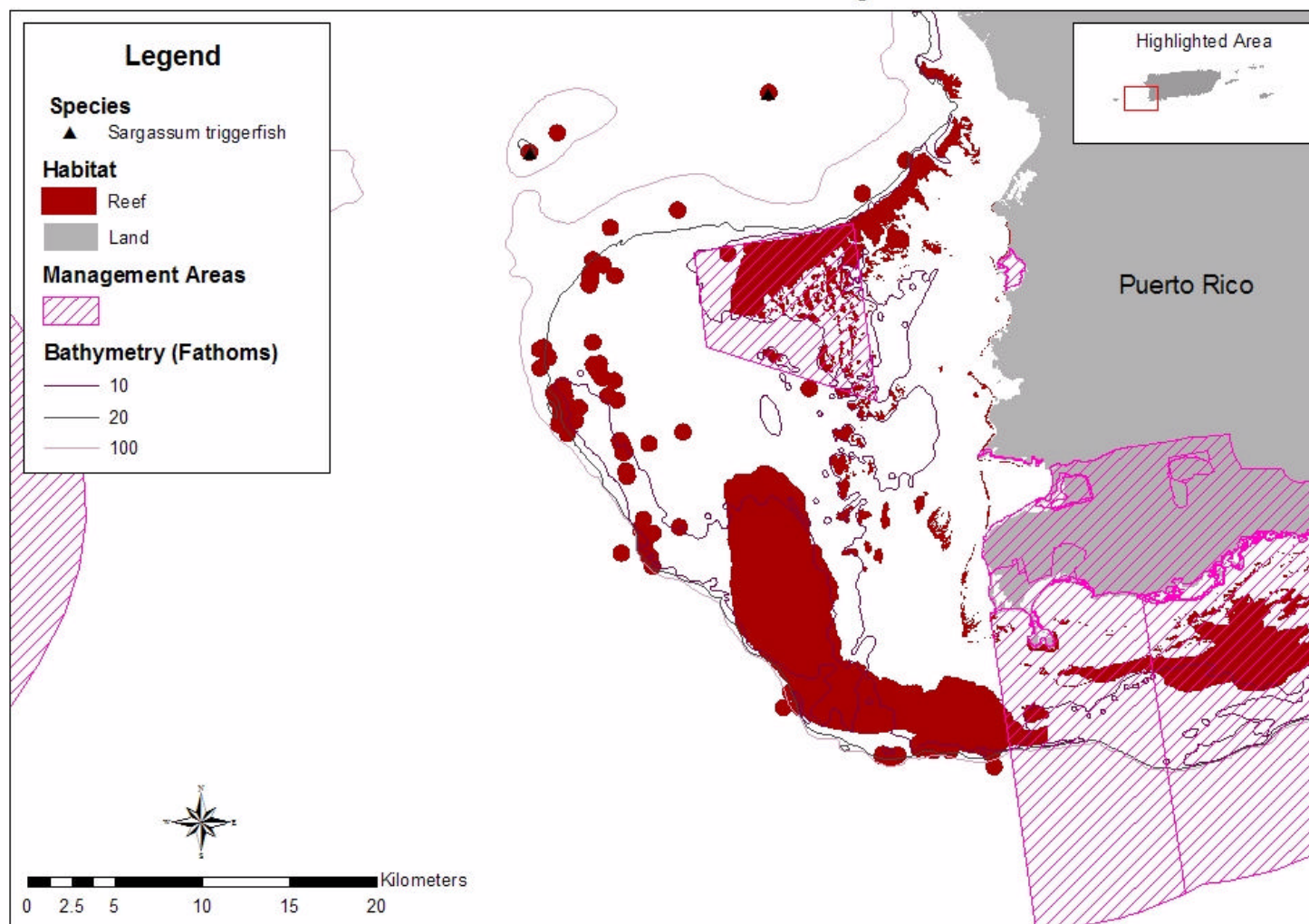
# Schoolmaster (*Lutjanus apodus*) - Running Ripe

## Puerto Rico: Southwest Coast Region

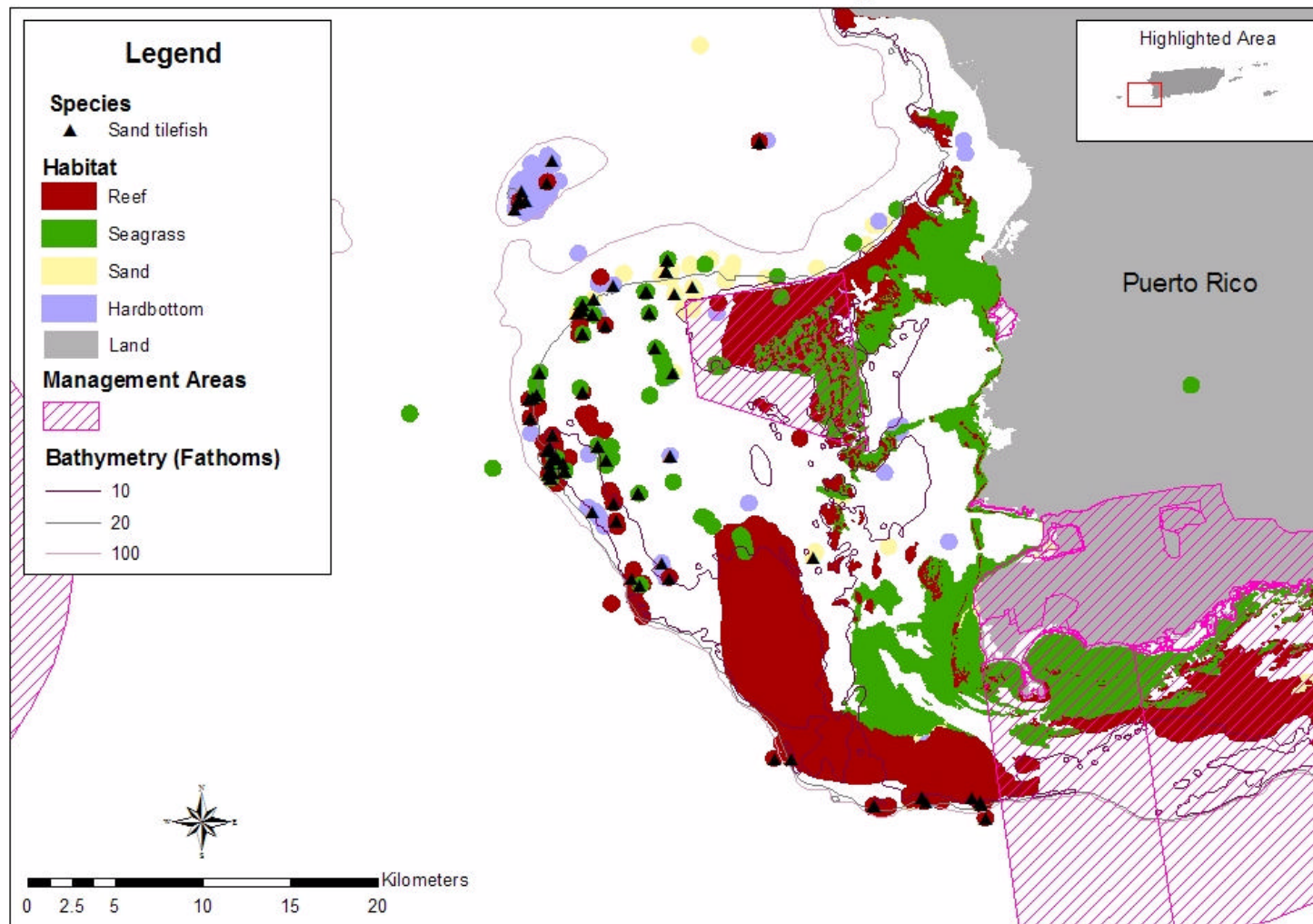




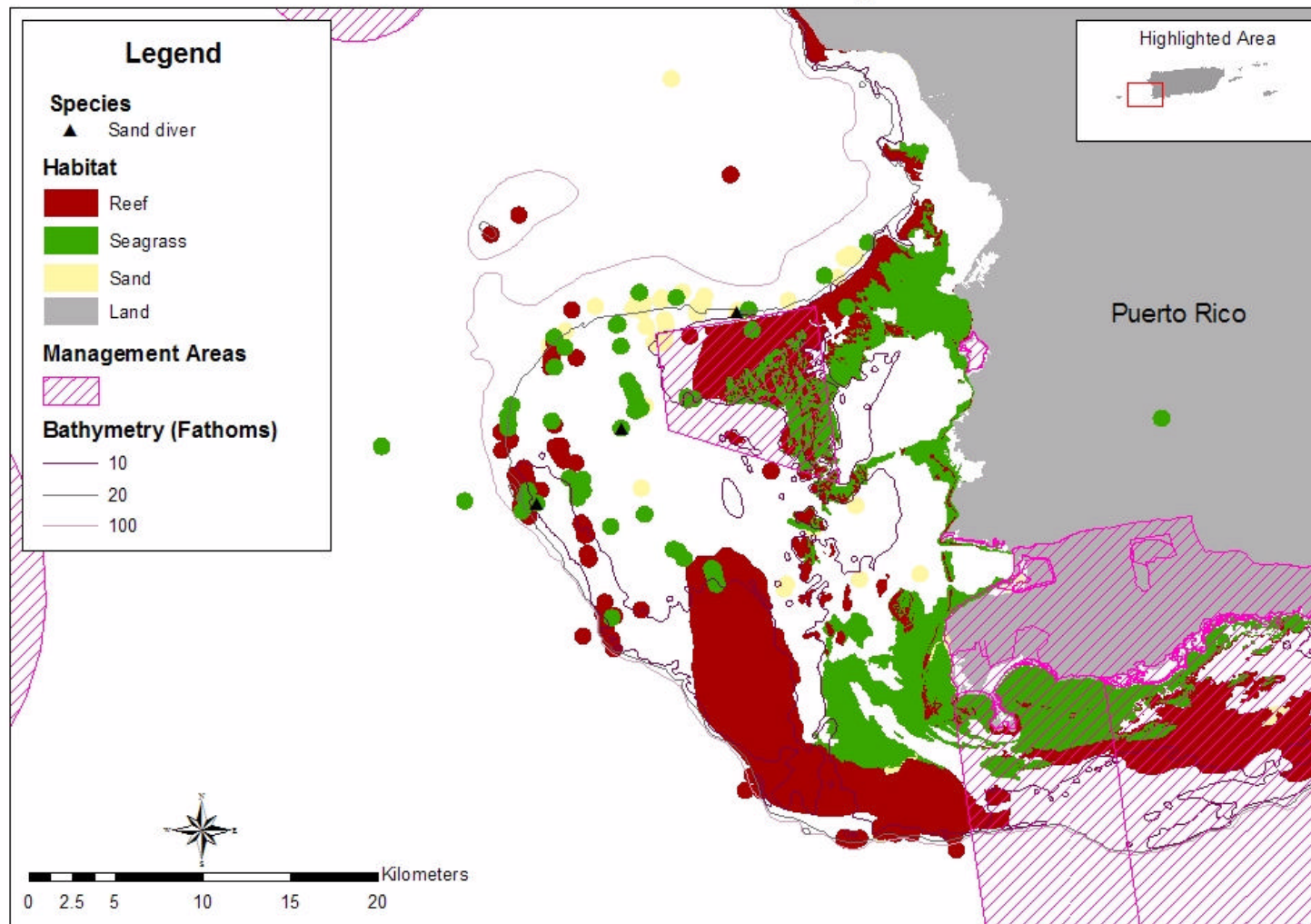
# Sargassum triggerfish (*Xanthichthys ringens*) - Running Ripe Puerto Rico: Southwest Coast Region



Sand tilefish ( *Malacanthus plumieri* ) - Running Ripe  
Puerto Rico: Southwest Coast Region

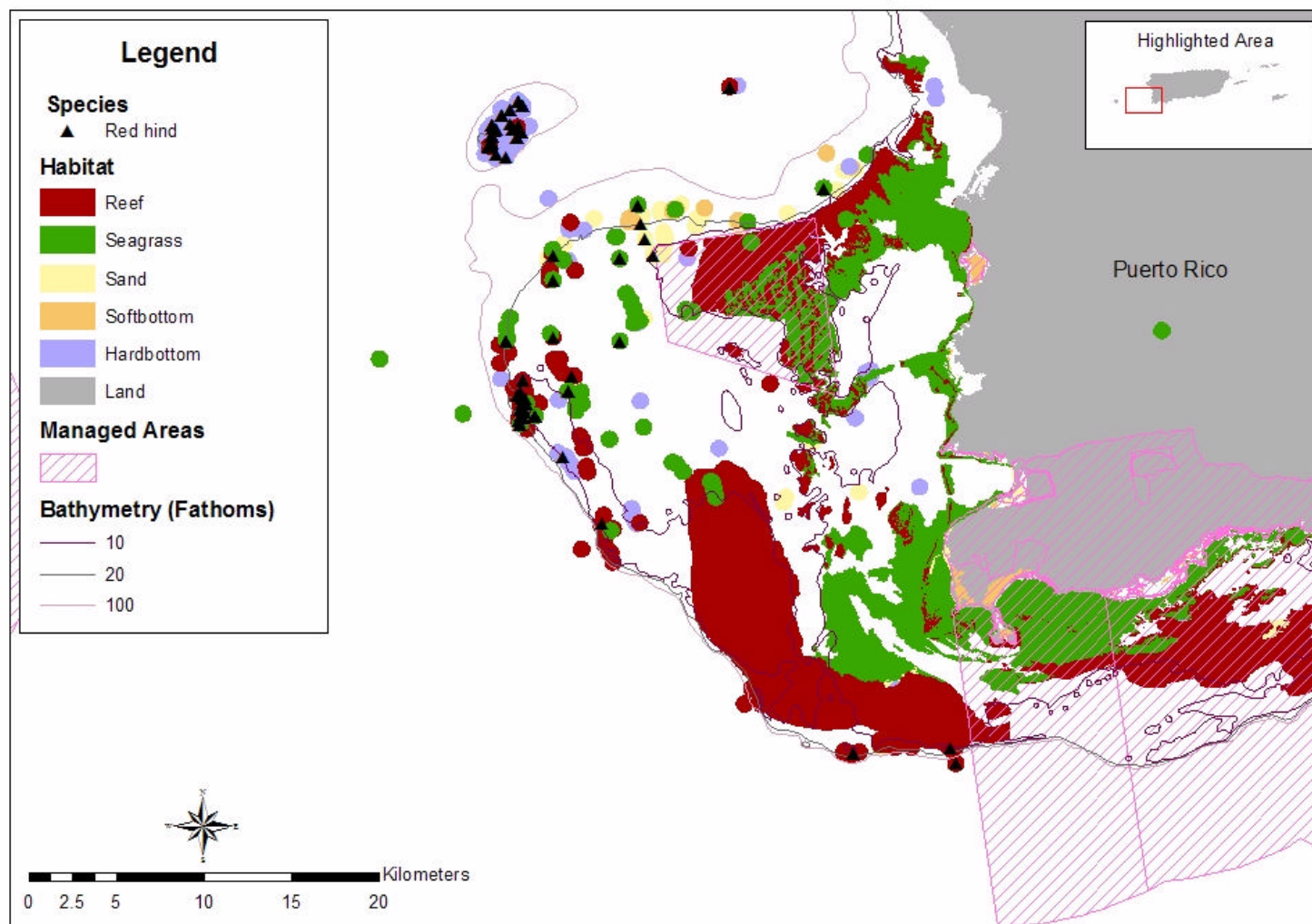


Sand diver (*Synodus intermedius*) - Running Ripe  
Puerto Rico: Southwest Coast Region

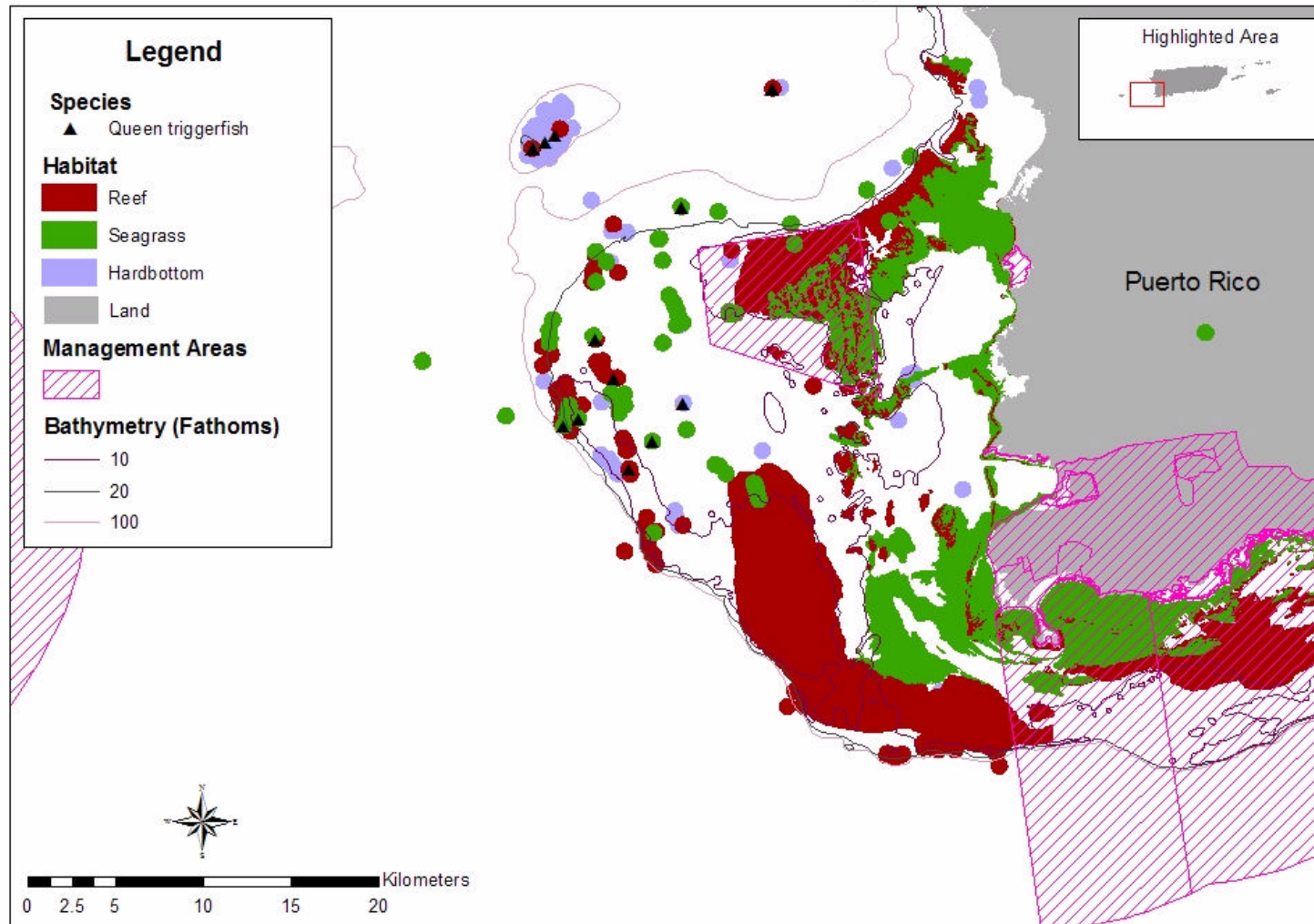




# Red hind (*Epinephelus guttatus*) - Running Ripe Puerto Rico: Southwest Coastal Region

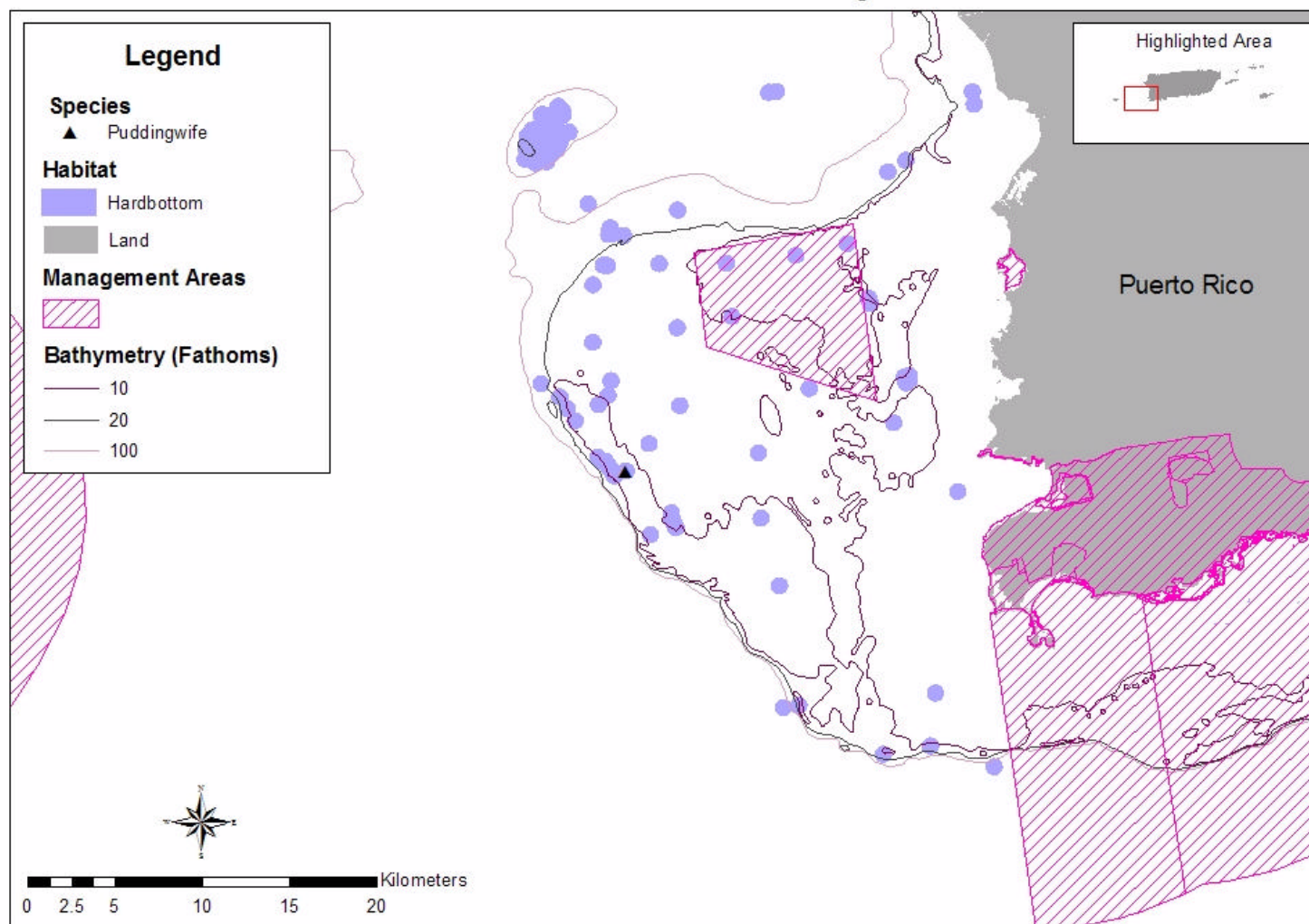


Queen triggerfish (*Balistes vetula*) - Running Ripe  
Puerto Rico: Southwest Coast Region

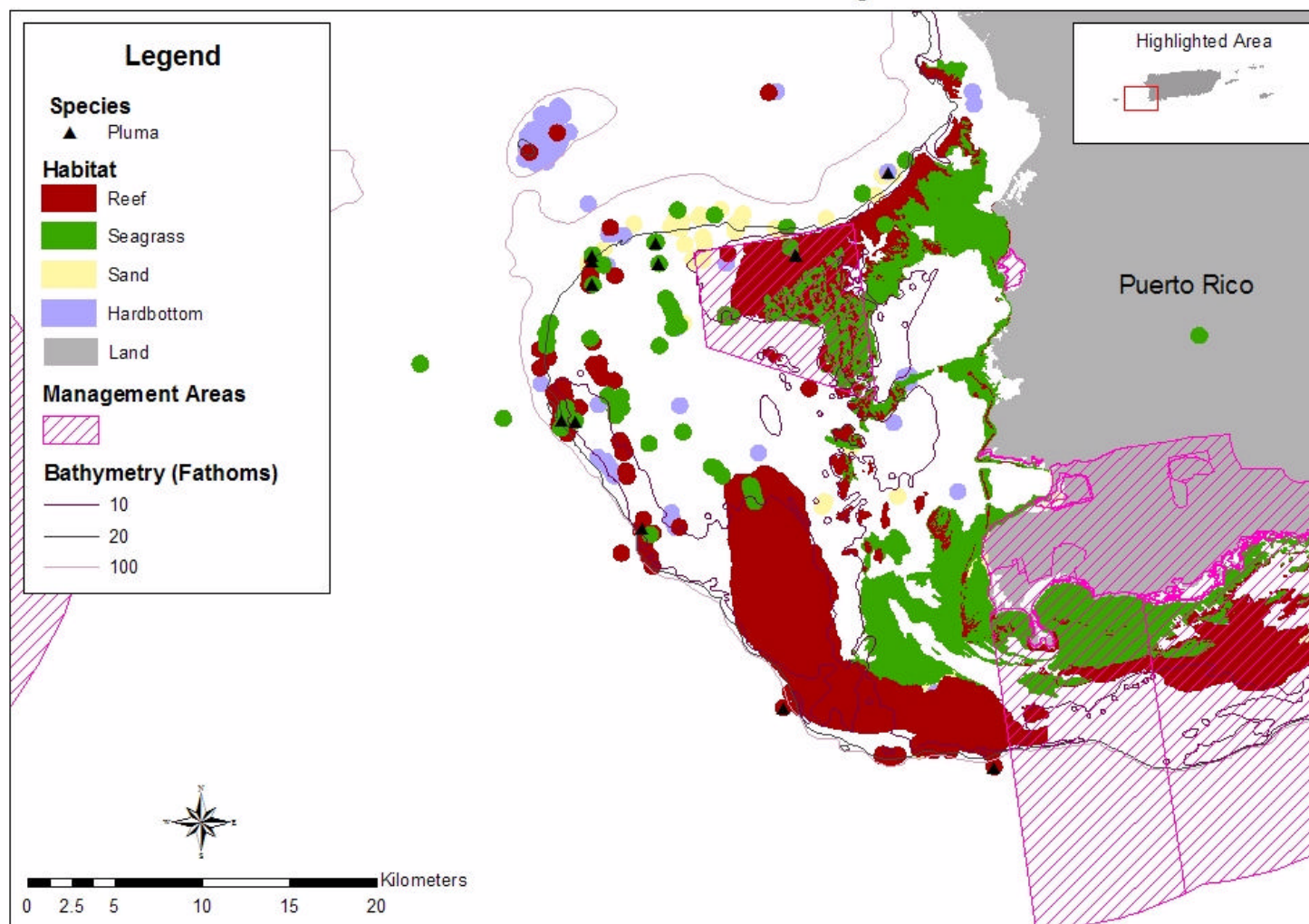




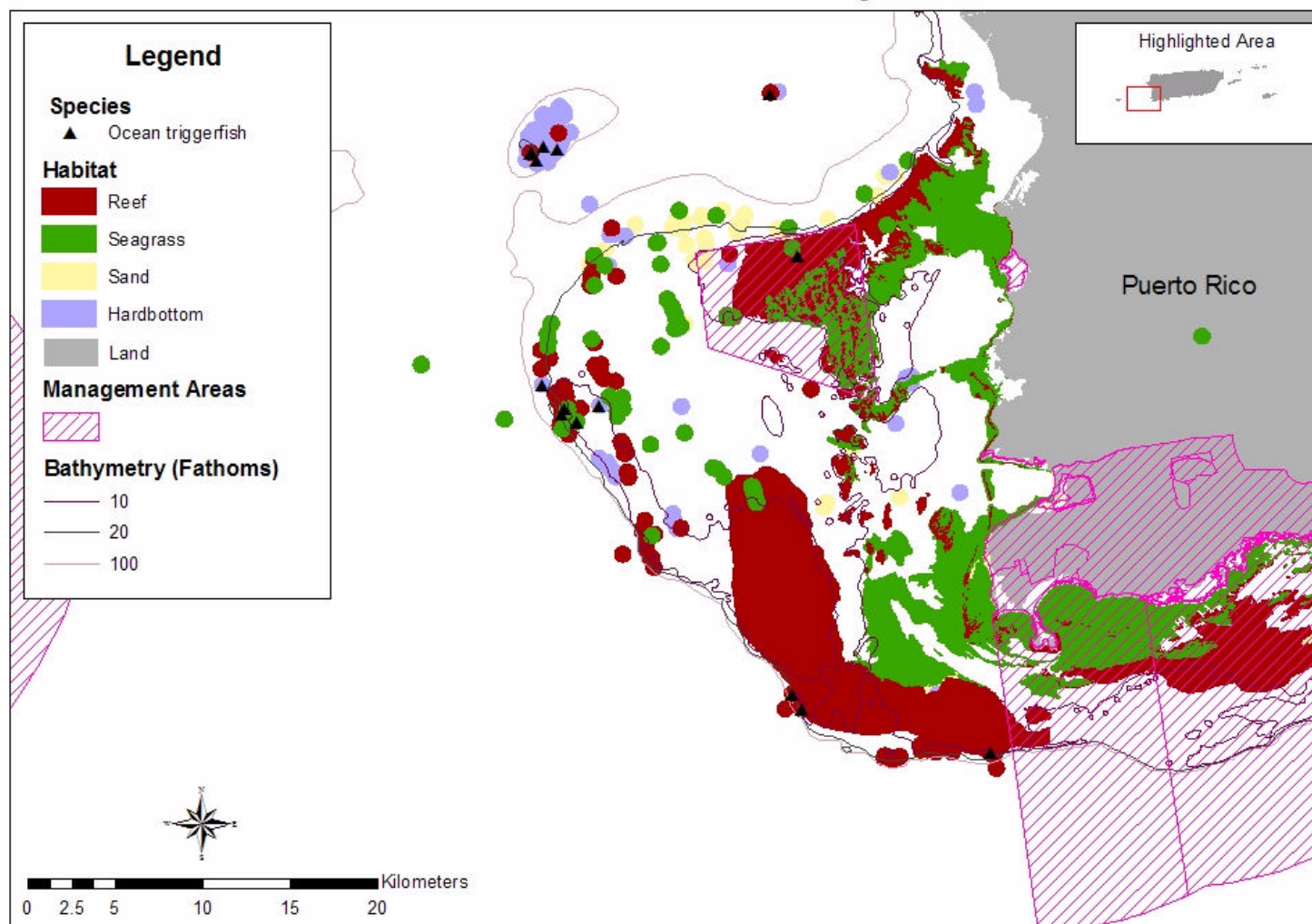
# Puddingwife (*Halichoeres radiatus*) - Running Ripe Puerto Rico: Southwest Coast Region



Pluma (*Calamus pennatula*) - Running Ripe  
Puerto Rico: Southwest Coast Region

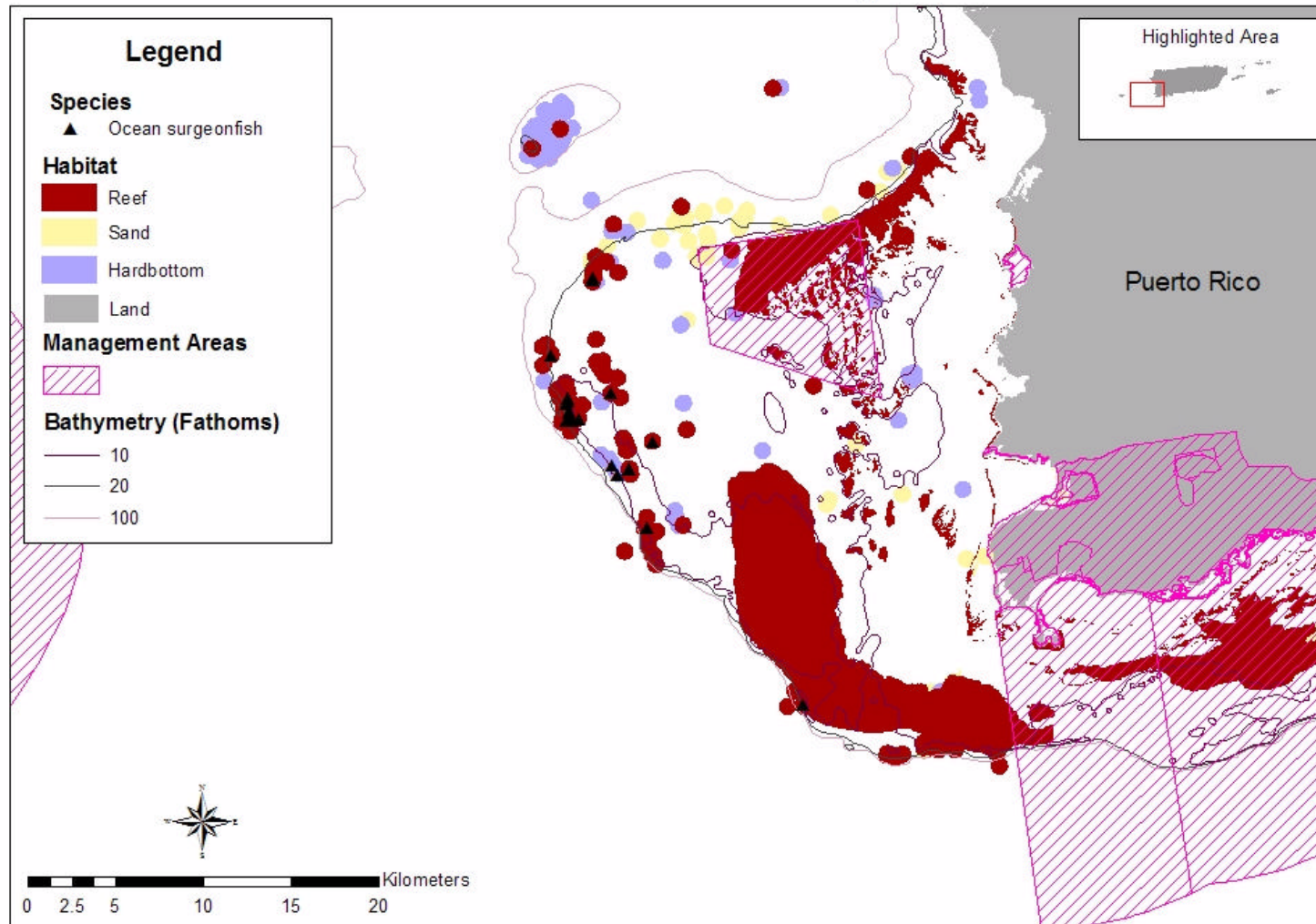


# Ocean triggerfish (*Canthidermis sufflamen*) - Running Ripe Puerto Rico: Southwest Coast Region

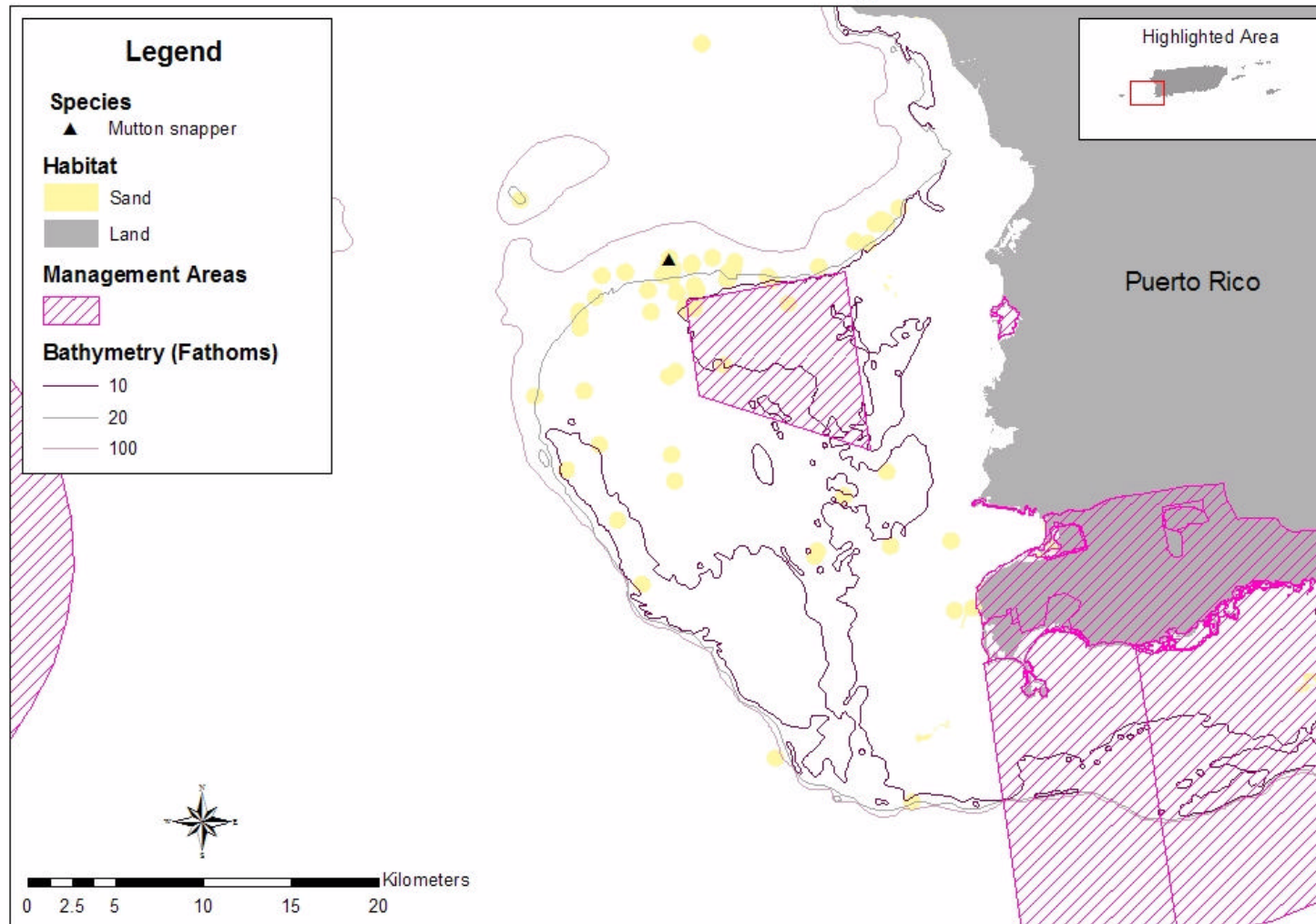




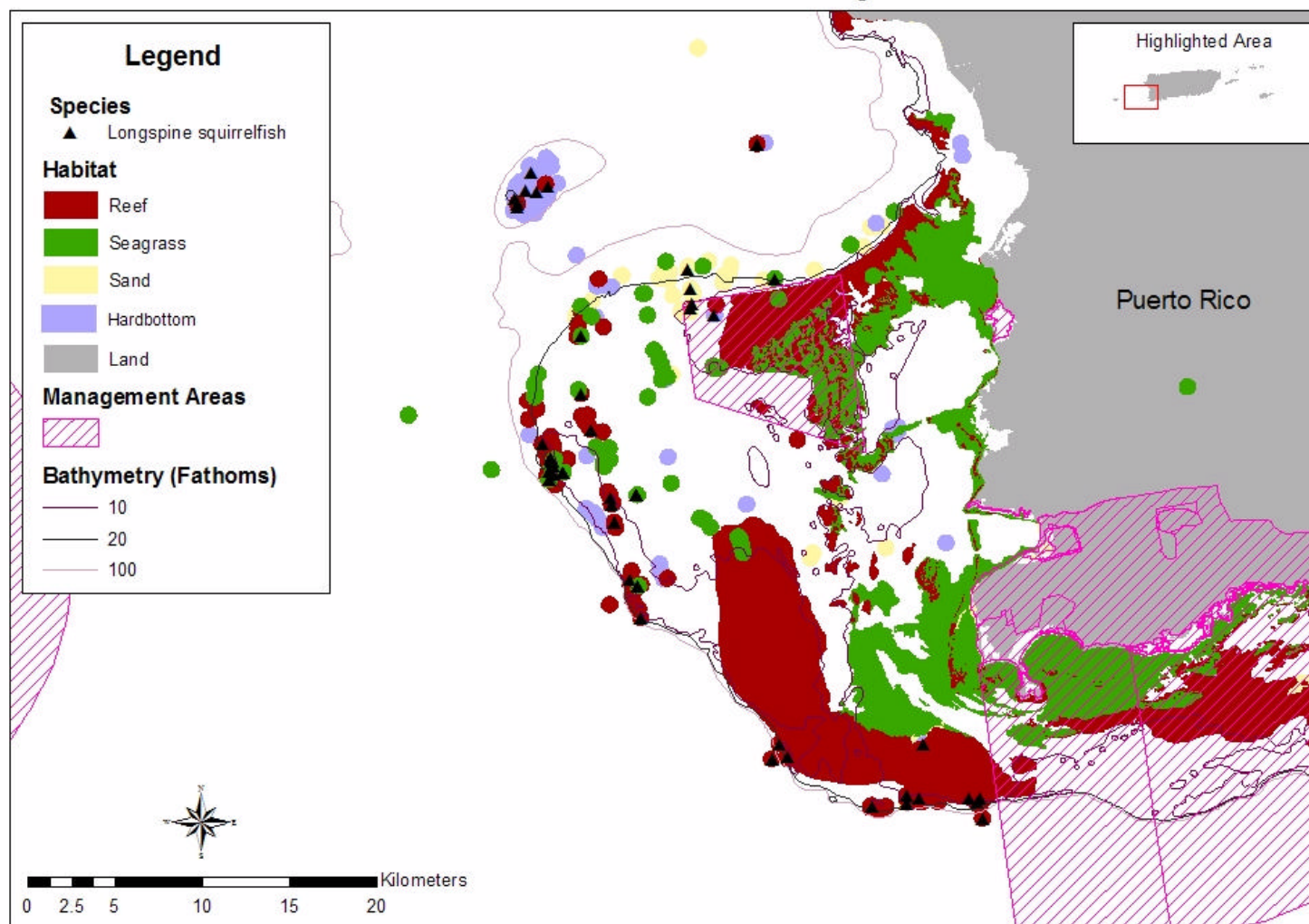
Ocean surgeonfish (*Acanthurus bahianus*) - Running Ripe  
Puerto Rico: Southwest Coast Region



Mutton snapper (*Lutjanus analis*) - Running Ripe  
Puerto Rico: Southwest Coast Region

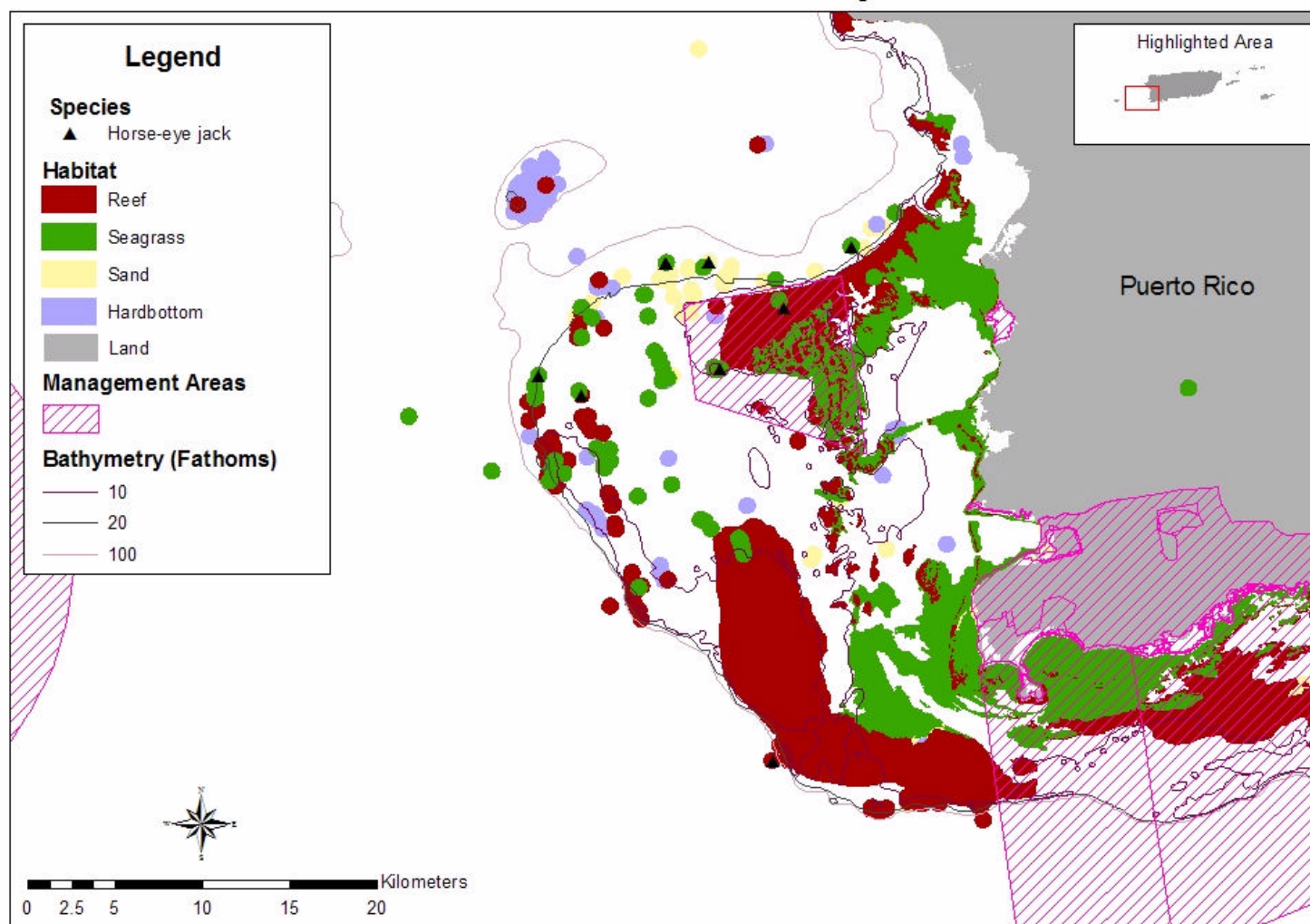


# Longspine squirrelfish (*Holocentrus rufus*) - Running Ripe Puerto Rico: Southwest Coast Region

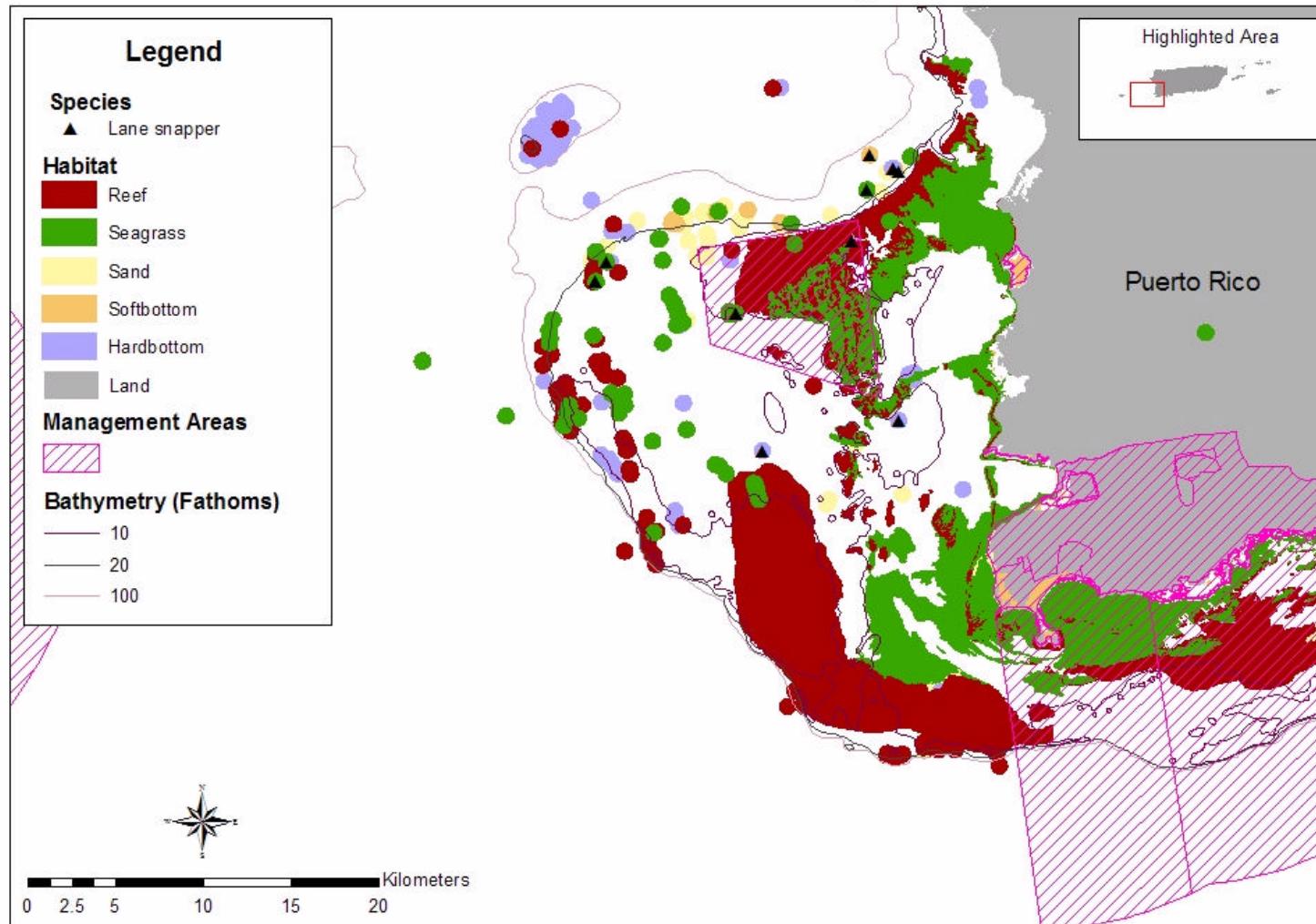




# Horse-eye jack (*Caranx latus*) - Running Ripe Puerto Rico: Southwest Coast Region



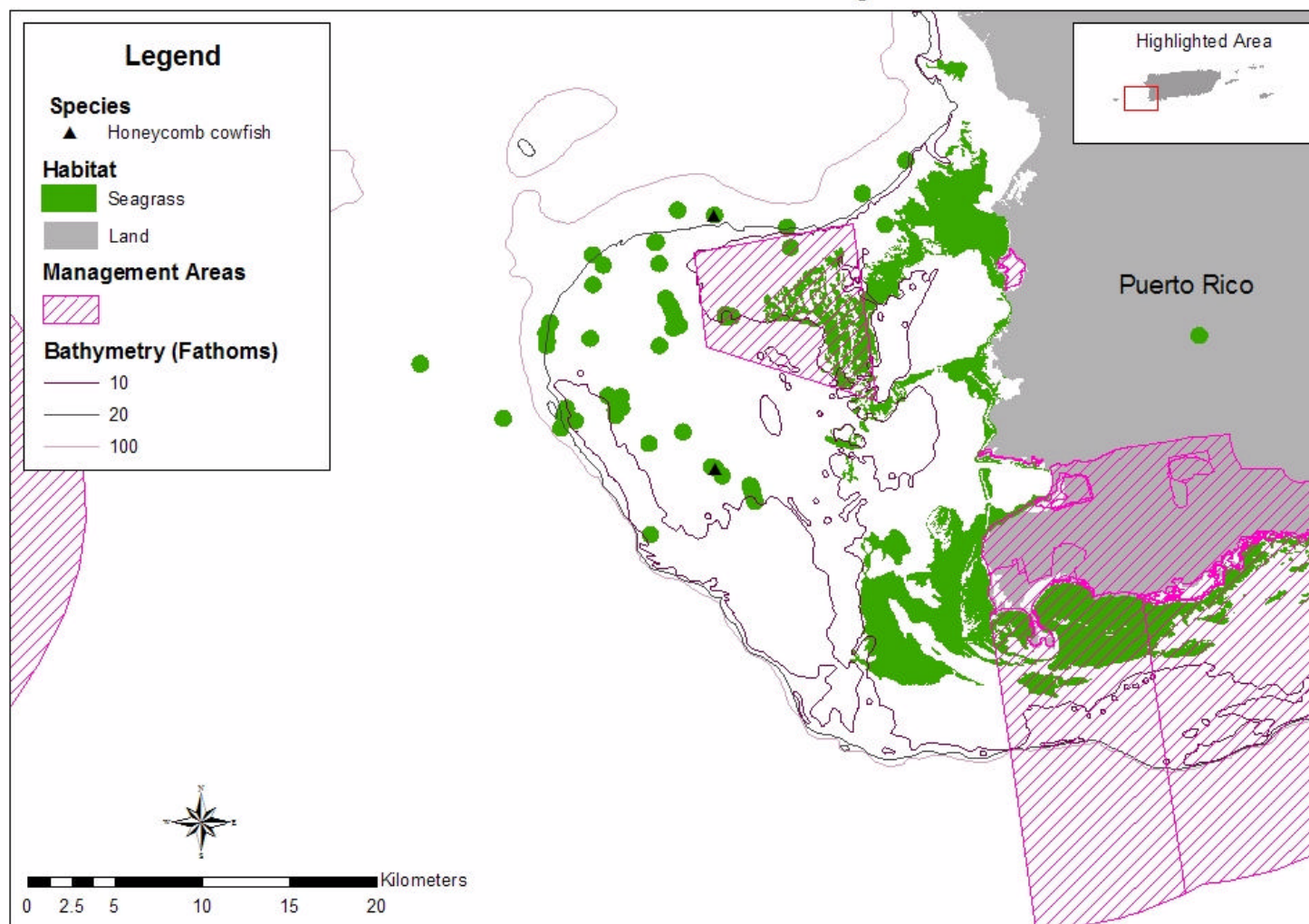
Lane snapper (*Lutjanus synagris*) - Running Ripe  
Puerto Rico: Southwest Coast Region



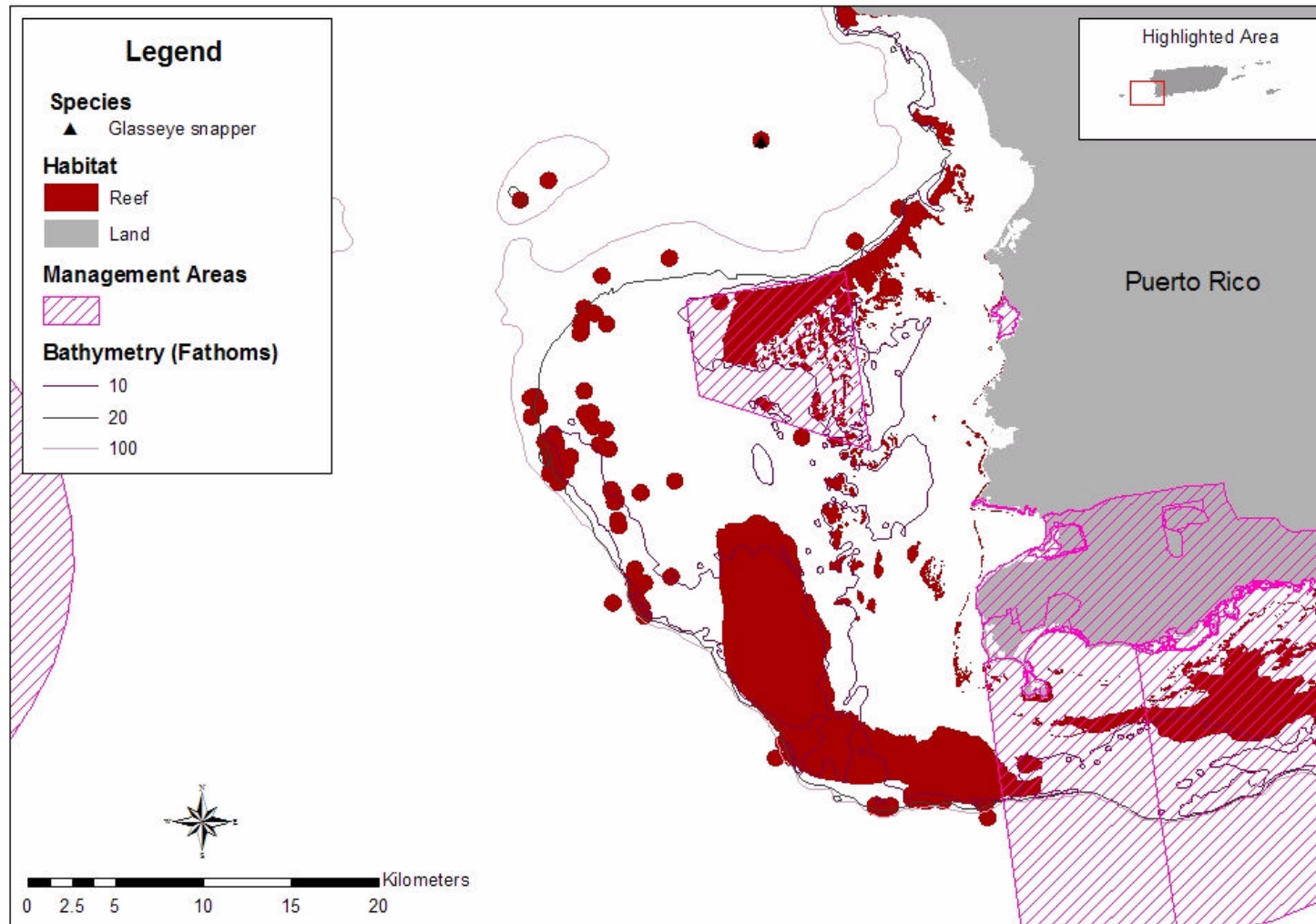


# Honeycomb cowfish (*Lactophrys polygonia*) - Running Ripe

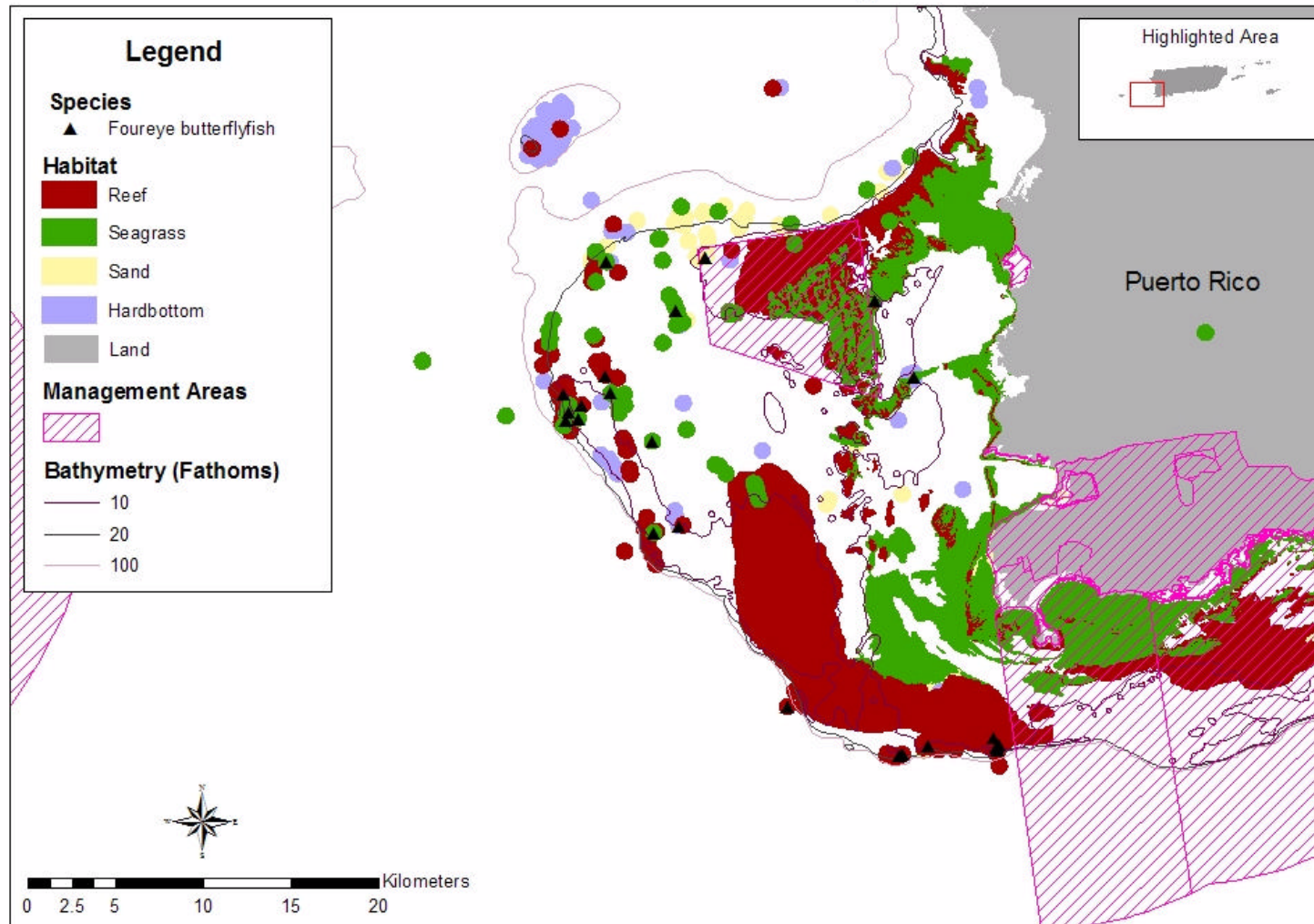
## Puerto Rico: Southwest Coast Region



Glasseye snapper (*Priacanthus cruentatus*) - Running Ripe  
Puerto Rico: Southwest Coast Region

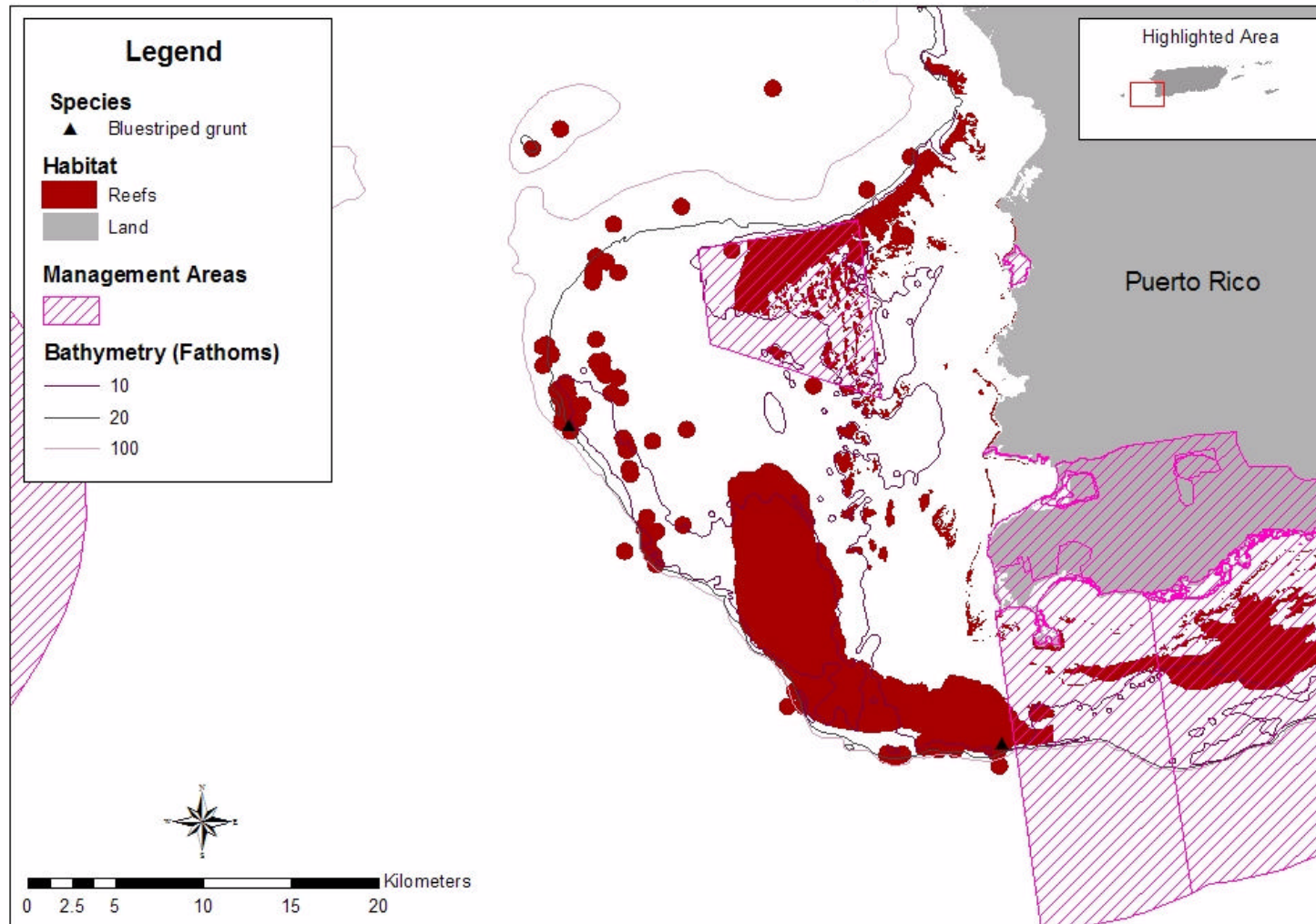


Foureye butterflyfish (*Chaetodon capistratus*) - Running Ripe  
Puerto Rico: Southwest Coast Region

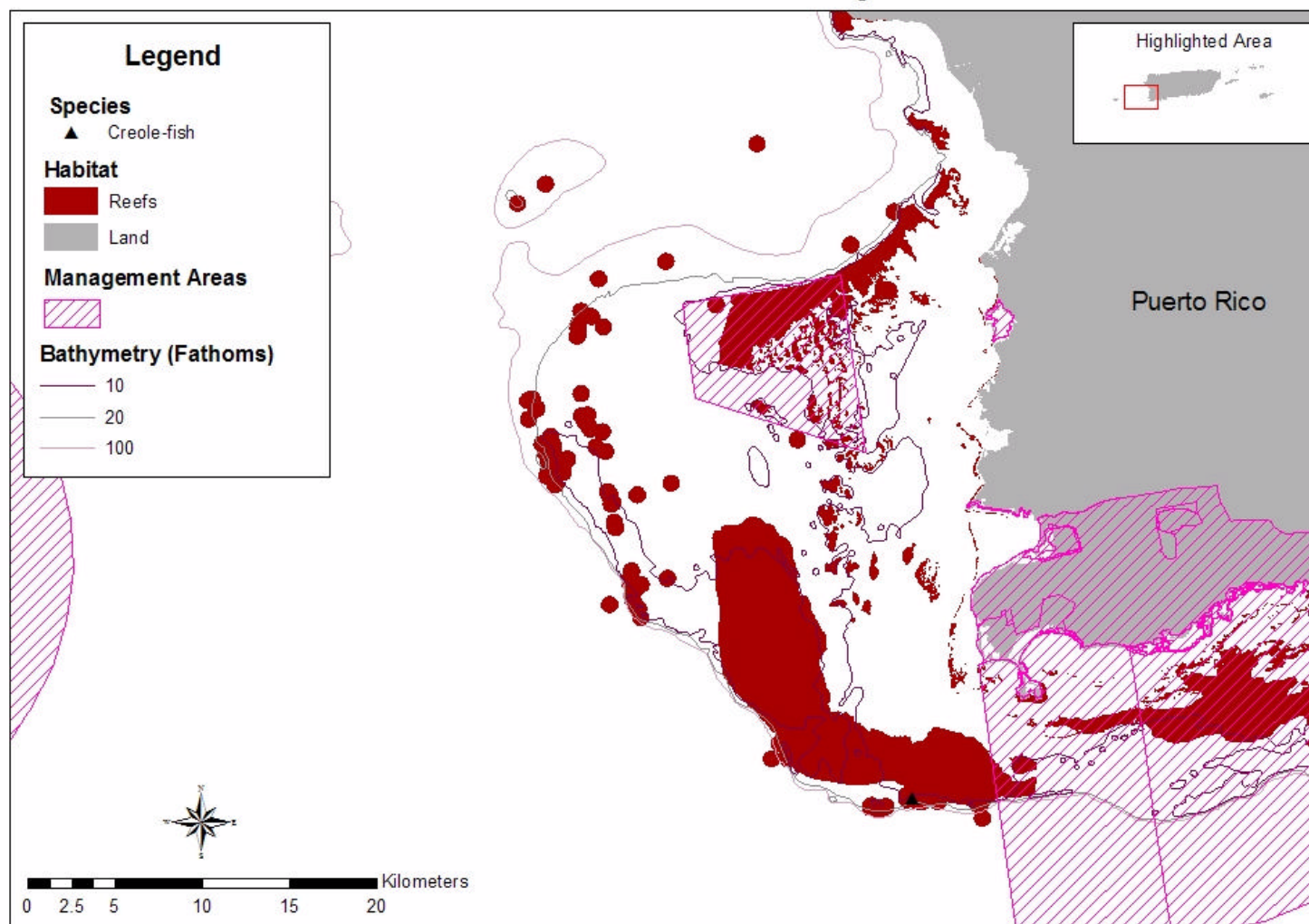




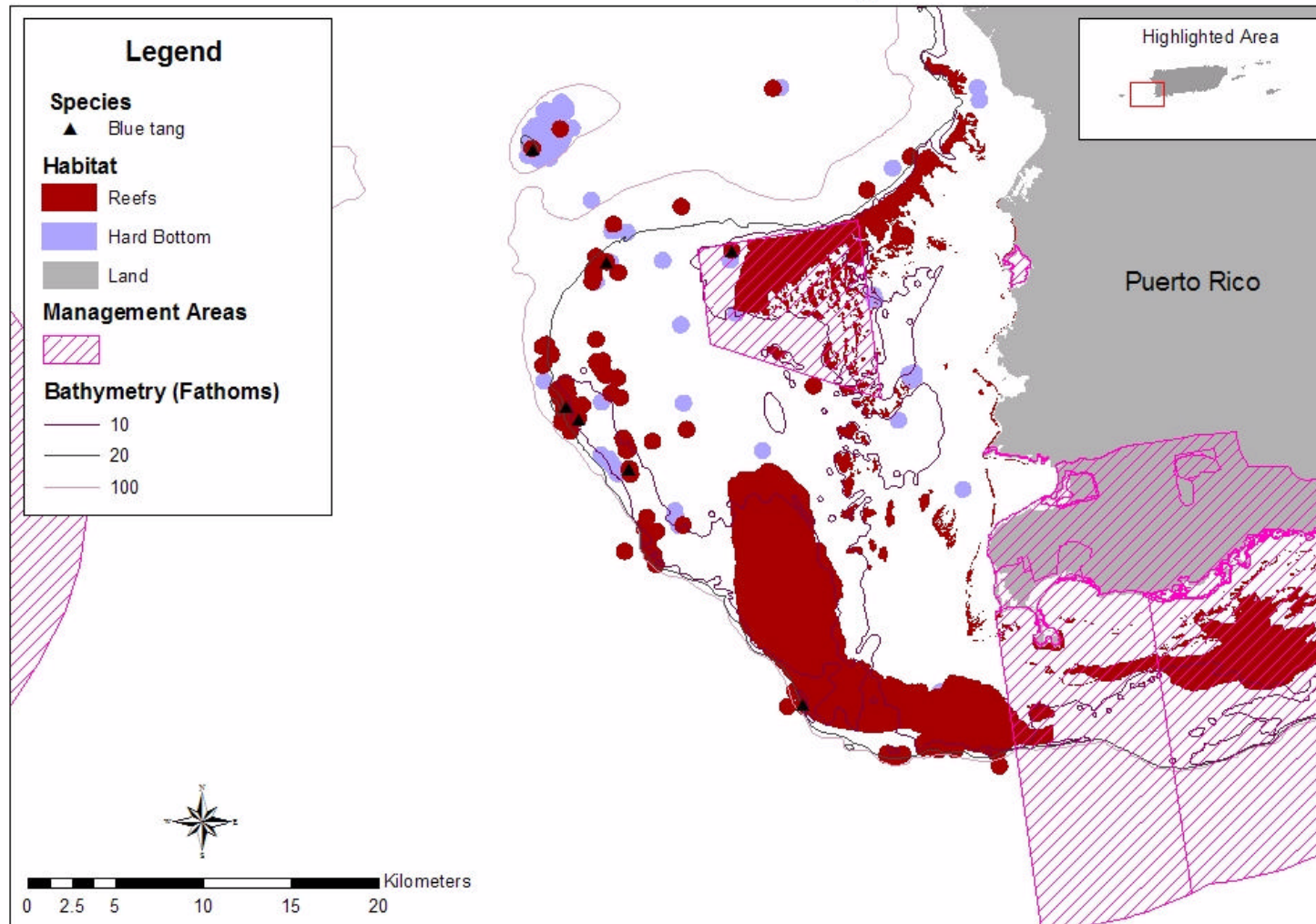
Bluestriped grunt (*Haemulon sciurus*) - Running Ripe  
Puerto Rico: Southwest Coast Region



# Creole-fish (*Paranthias furcifer*) - Running Ripe Puerto Rico: Southwest Coast Region

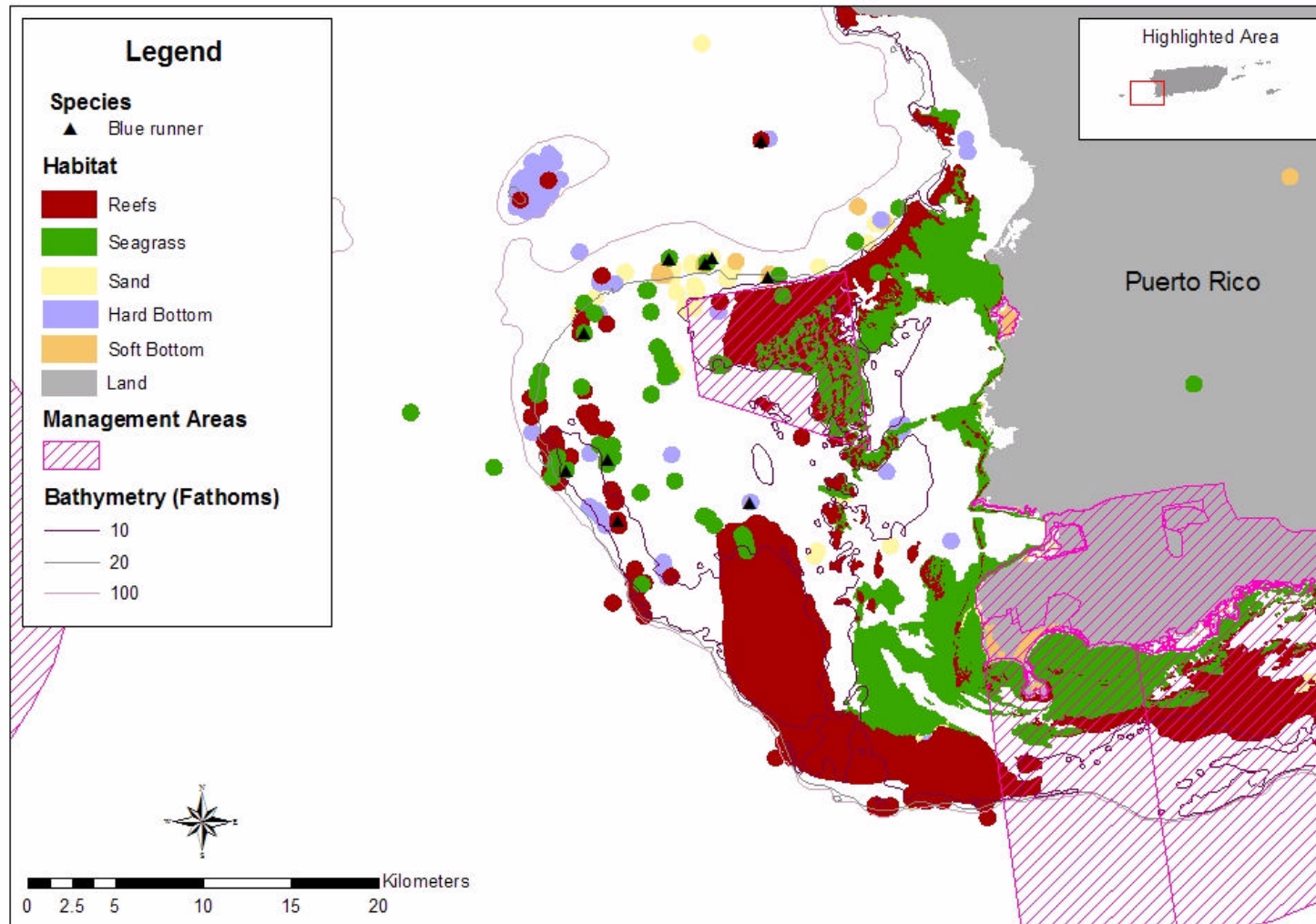


Blue tang (*Acanthurus coeruleus*) - Running Ripe  
Puerto Rico: Southwest Coast Region

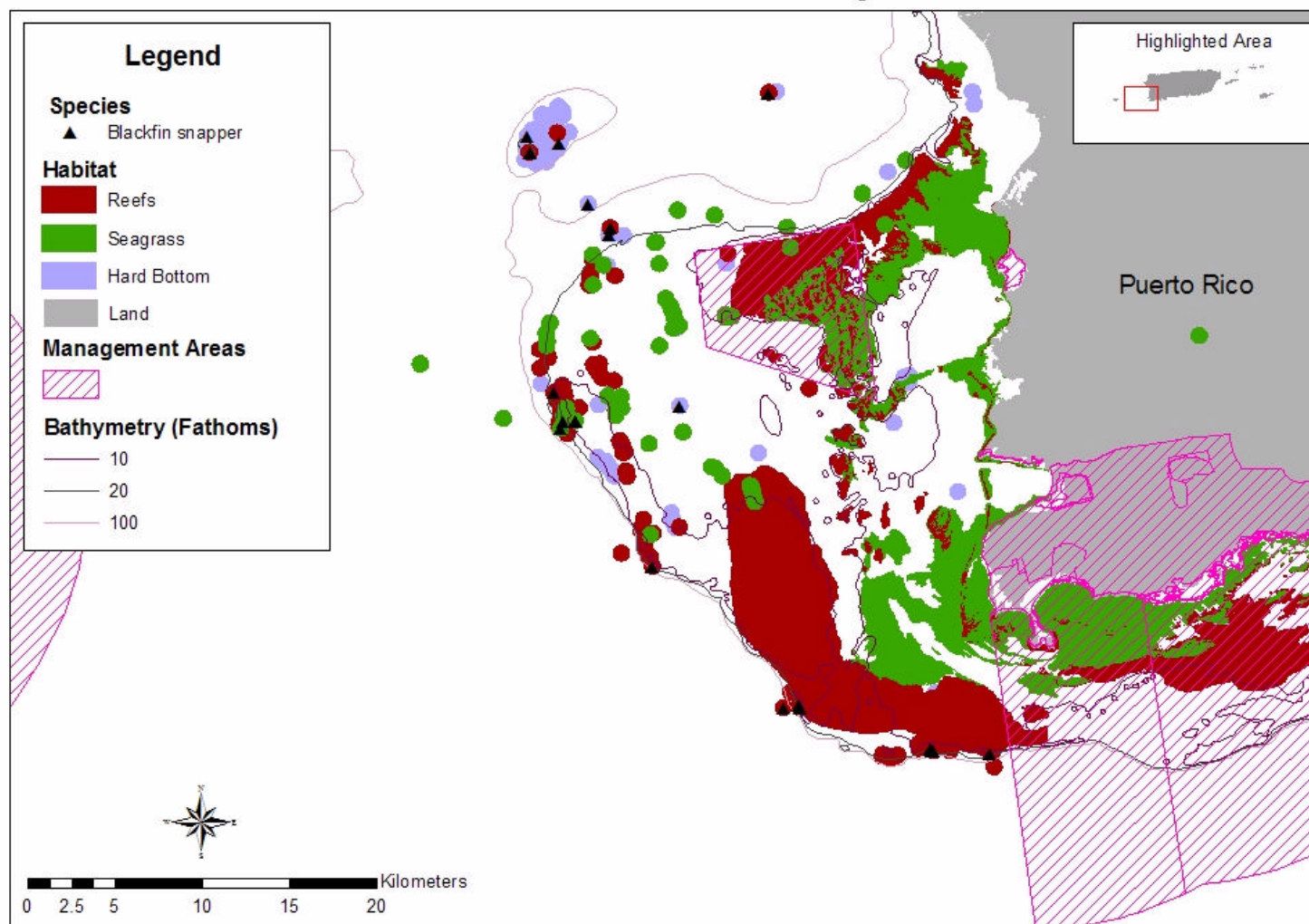




# Blue runner (*Caranx crysos*) - Running Ripe Puerto Rico: Southwest Coast Region

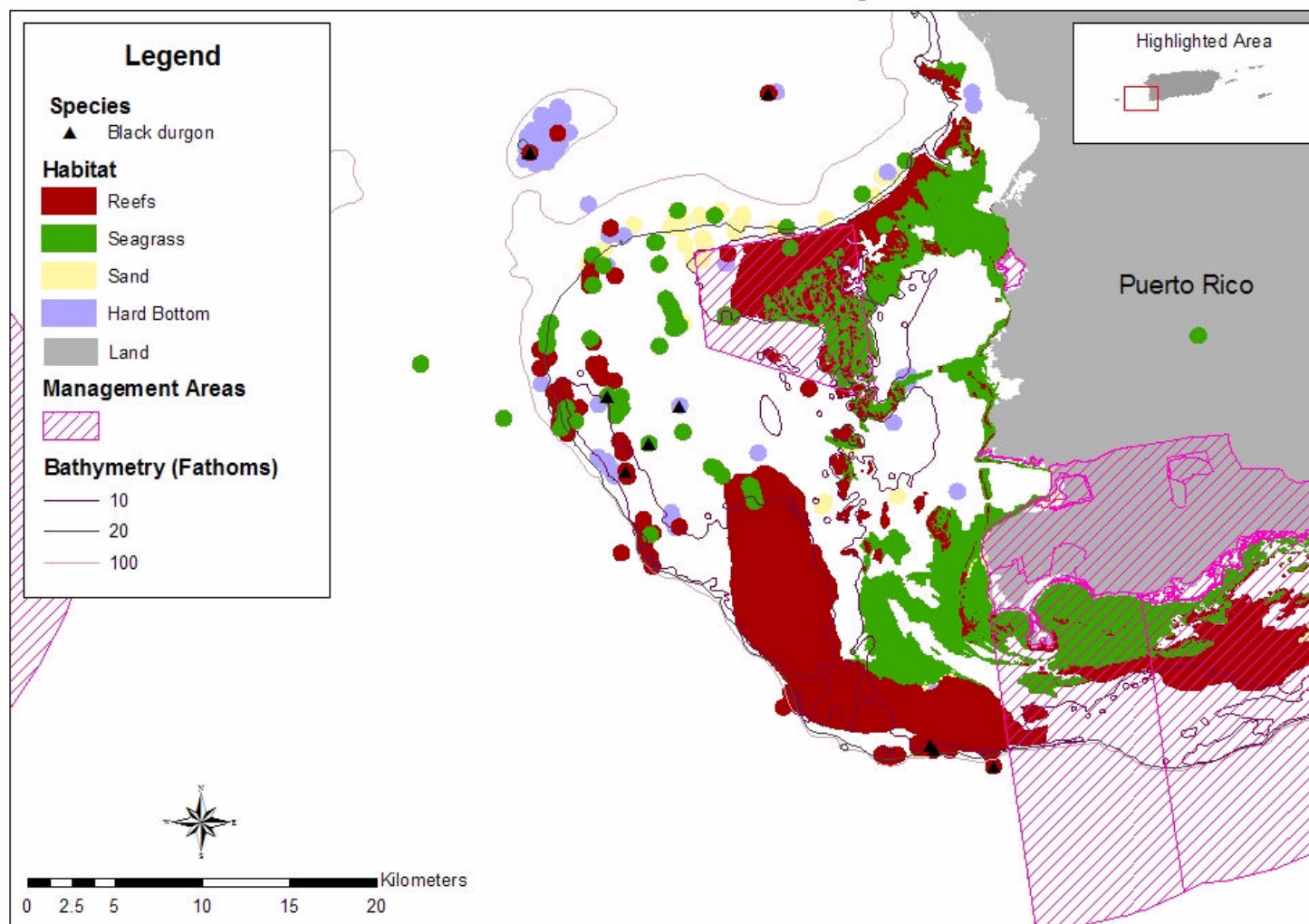


# Blackfin snapper (*Lutjanus buccanella*) - Running Ripe Puerto Rico: Southwest Coast Region

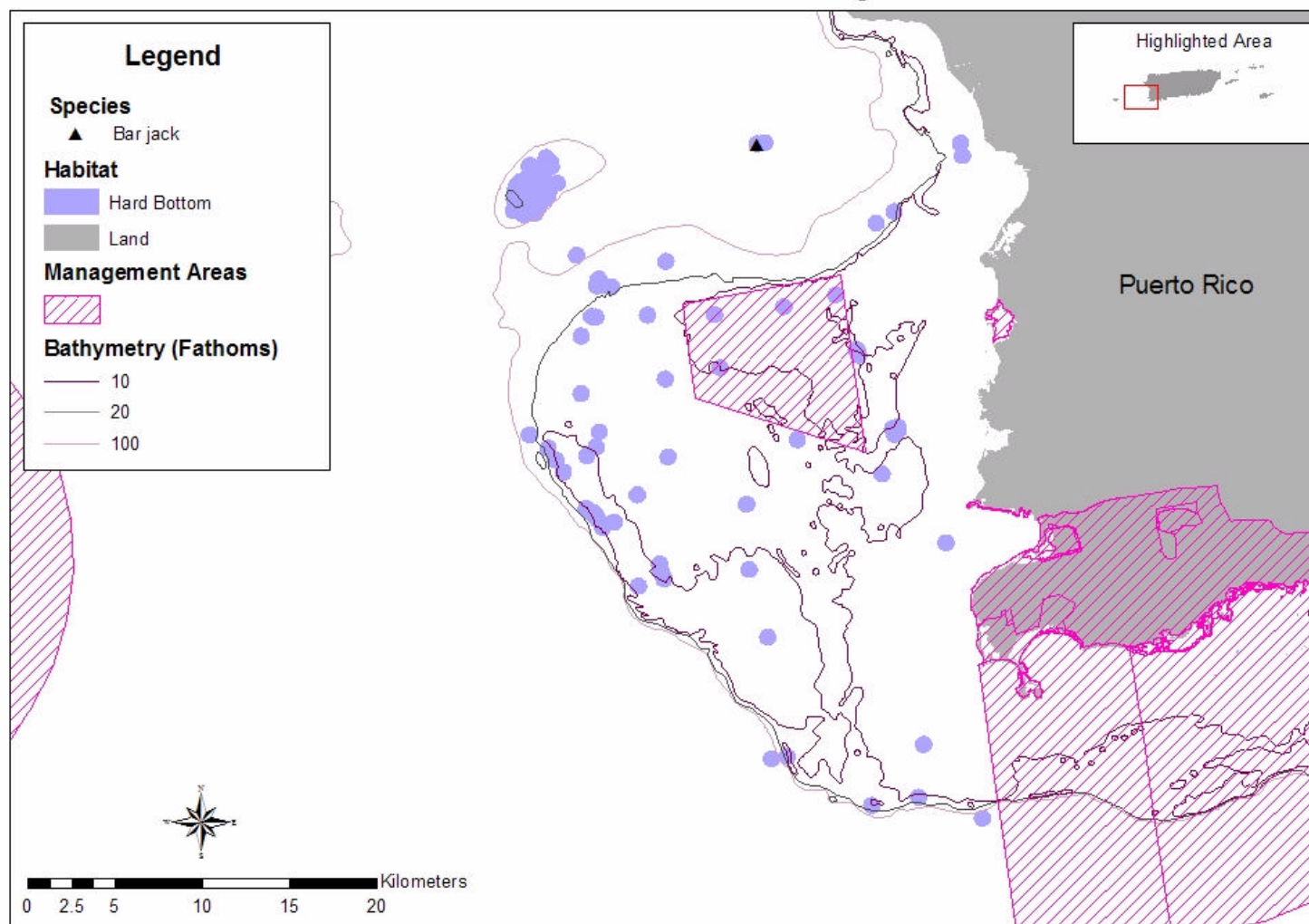




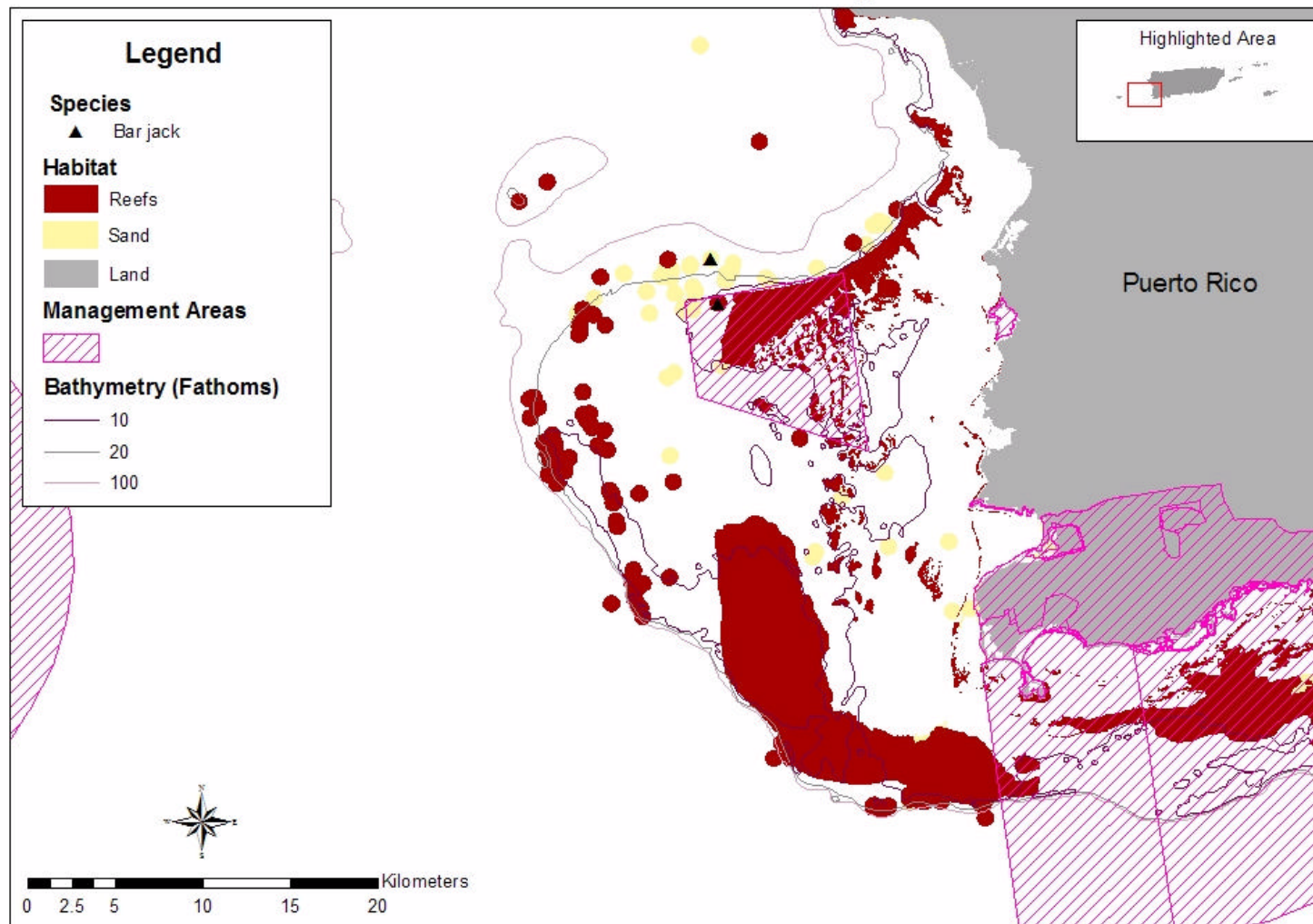
# Black durgon (*Melichthys niger*) - Running Ripe Puerto Rico: Southwest Coast Region



# Bigeye (*Priacanthus arenatus*) - Running Ripe Puerto Rico: Southwest Coast Region

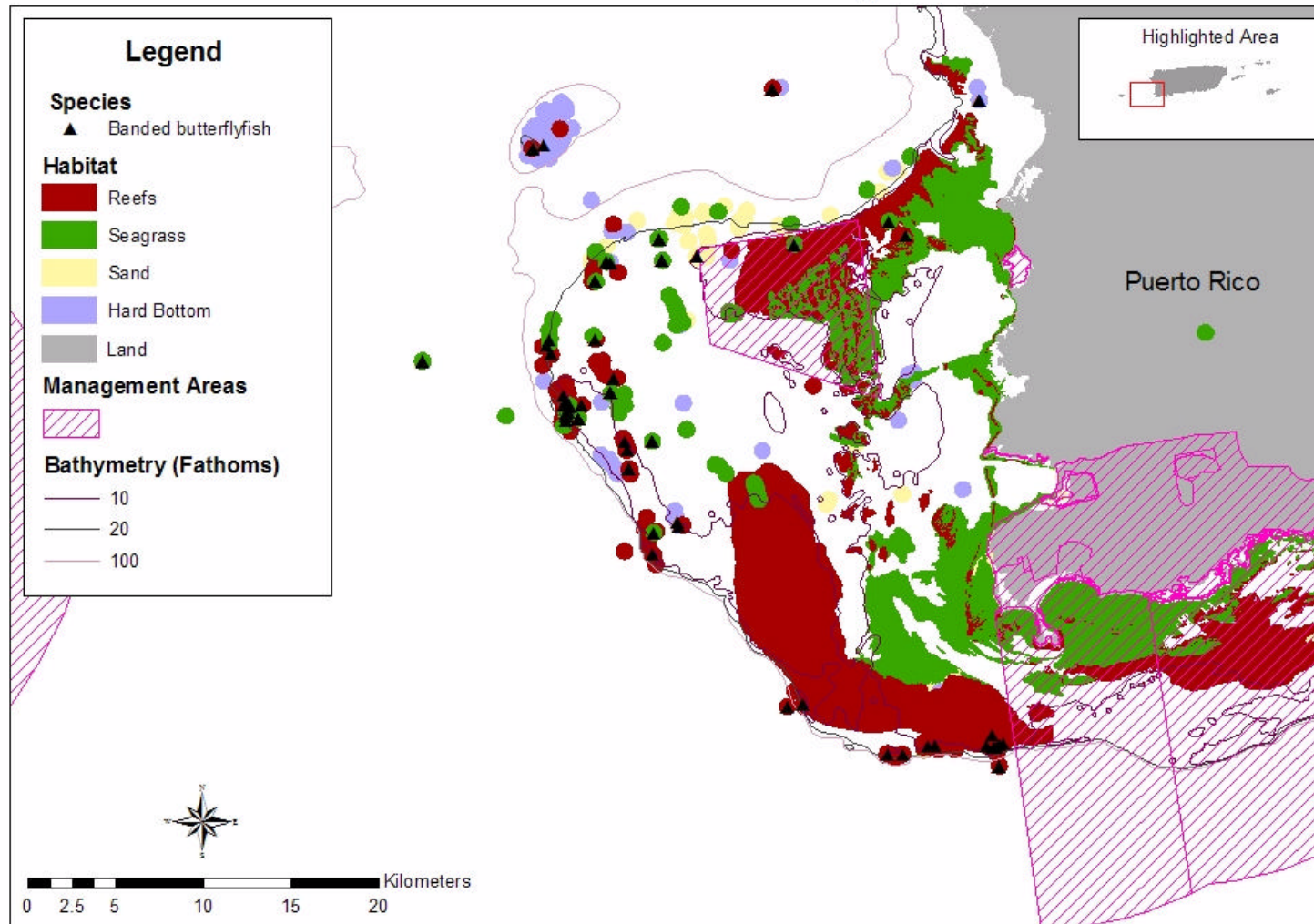


# Bar jack (*Caranx ruber*) - Running Ripe Puerto Rico: Southwest Coast Region

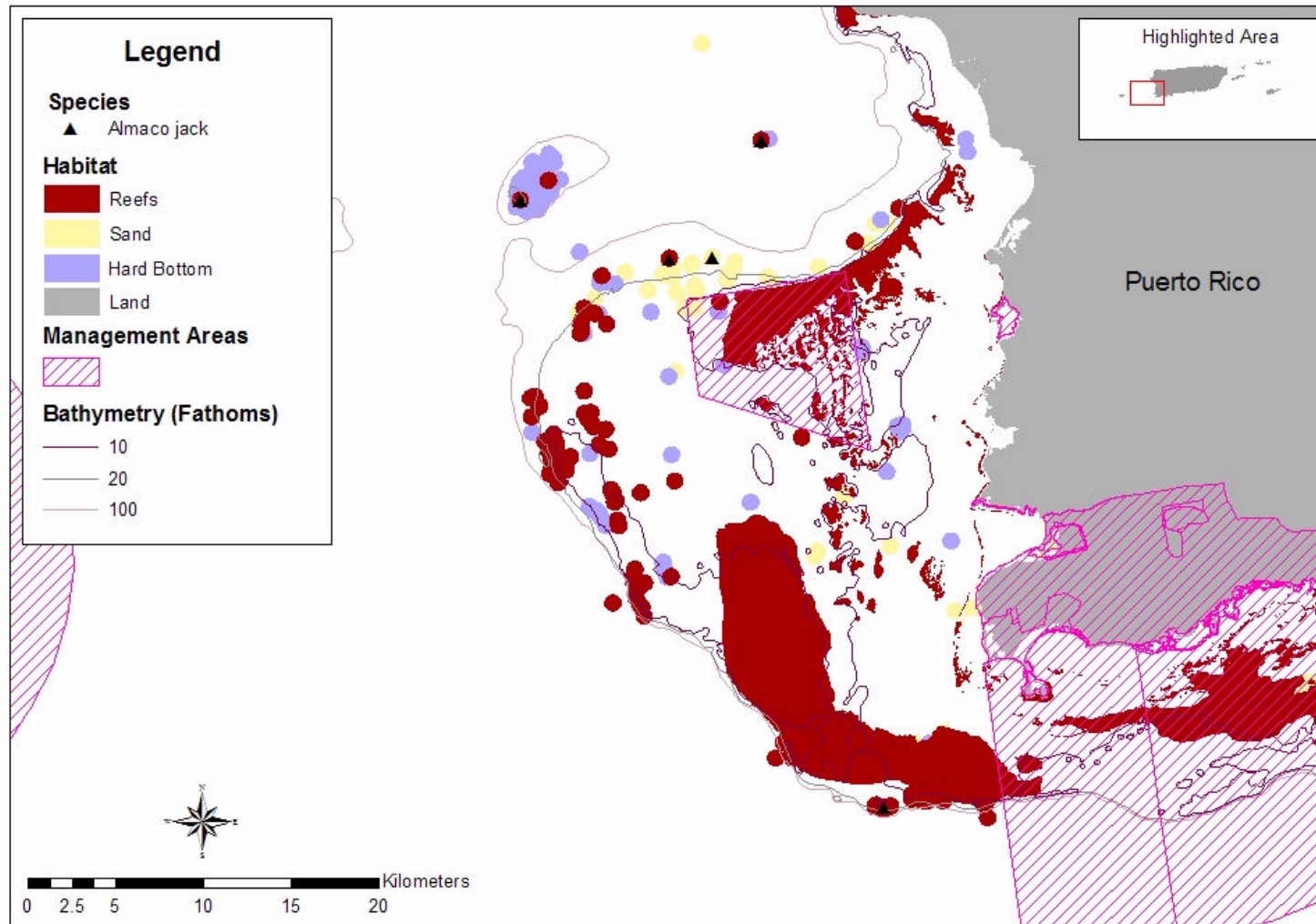




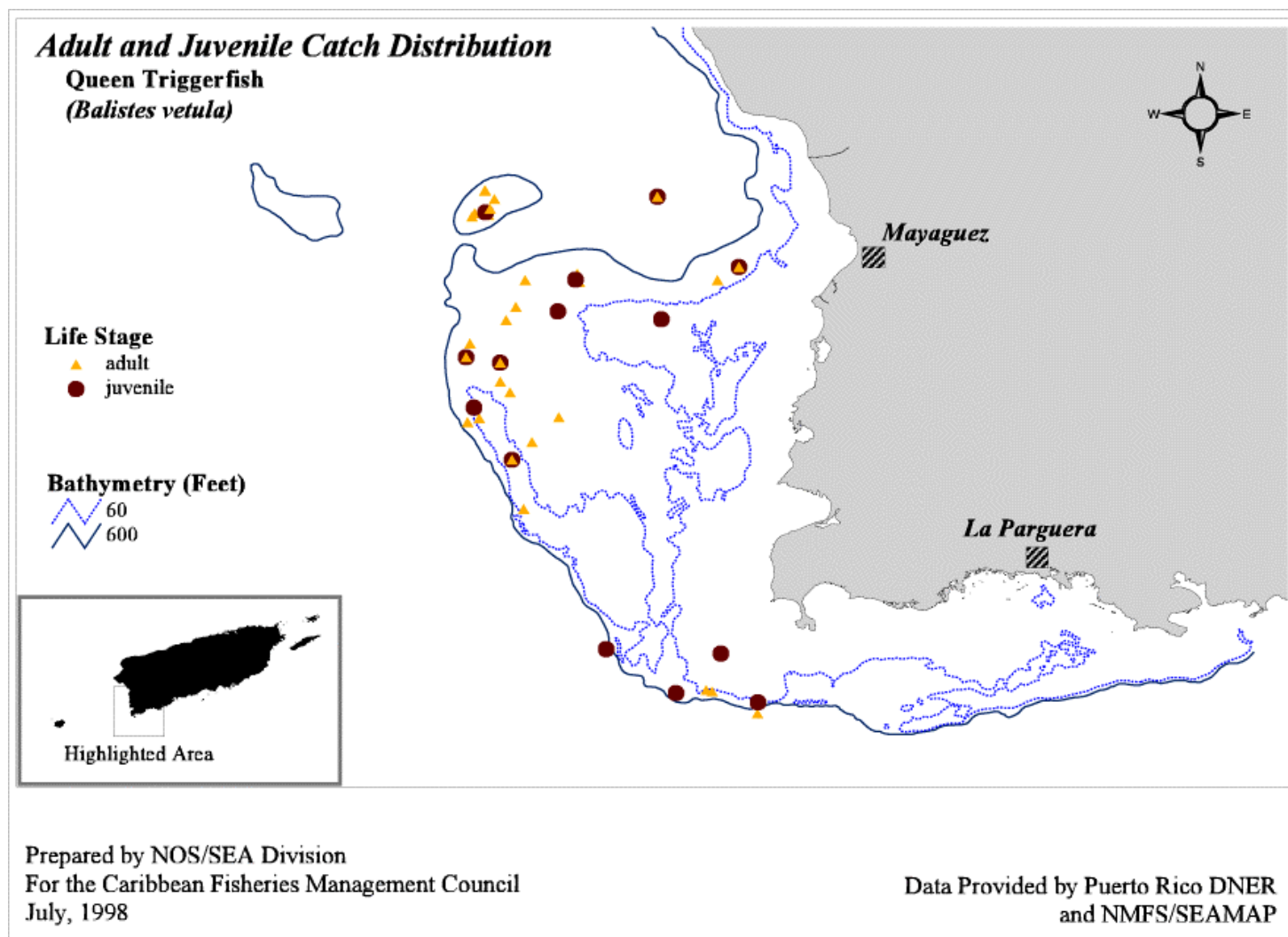
Banded butterflyfish ( *Chaetodon striatus* ) - Running Ripe  
Puerto Rico: Southwest Coast Region



# Almaco jack (*Seriola rivoliana*) - Running Ripe Puerto Rico: Southwest Coast Region



Appendix 4. Fish distributions for selected species off Southwestern Puerto Rico (from NOAA SEAMAP data)



## Adult and Juvenile Catch Distribution

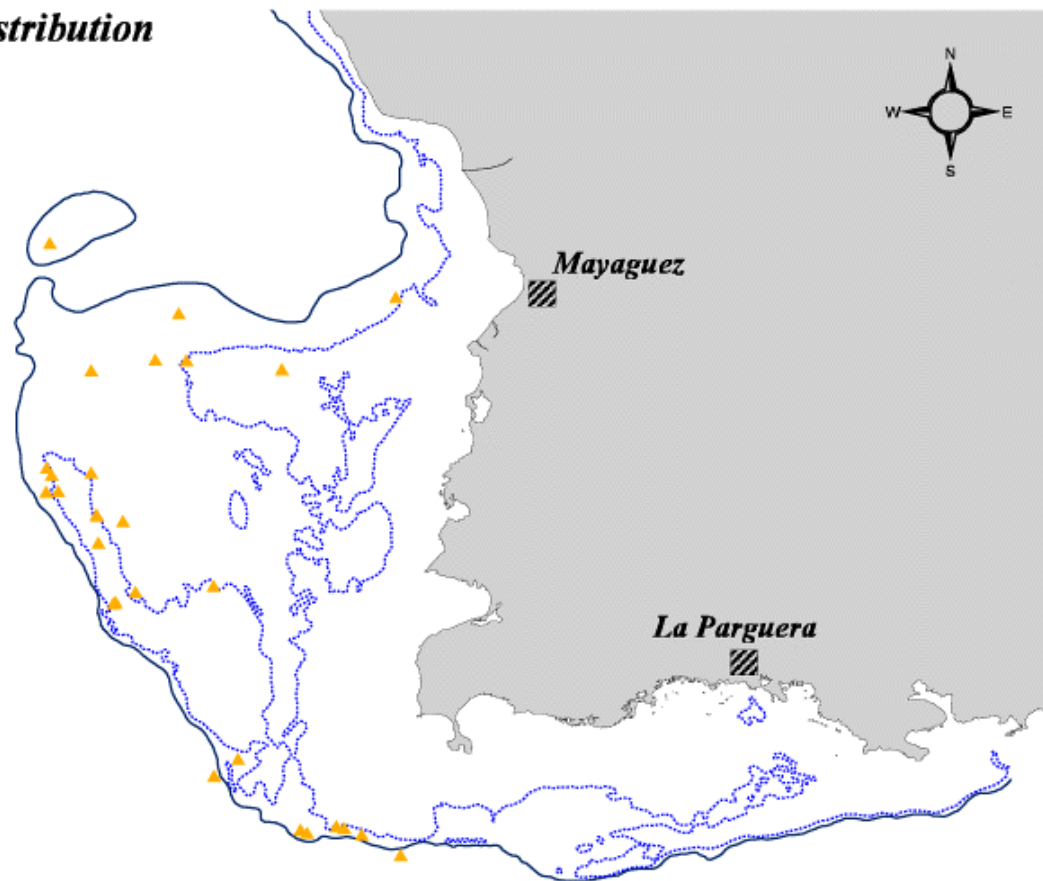
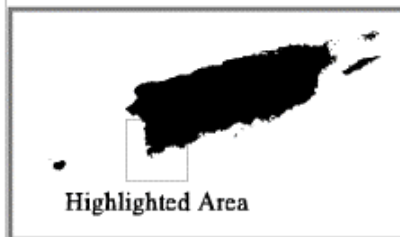
White Grunt  
(*Haemulon plumieri*)

### Life Stage

- ▲ adult
- juvenile

### Bathymetry (Feet)

- 60
- 600



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For the Caribbean Fisheries Management Council  
July, 1998

Data Provided by Puerto Rico DNER  
and NMFS/SEAMAP



## Adult and Juvenile Catch Distribution

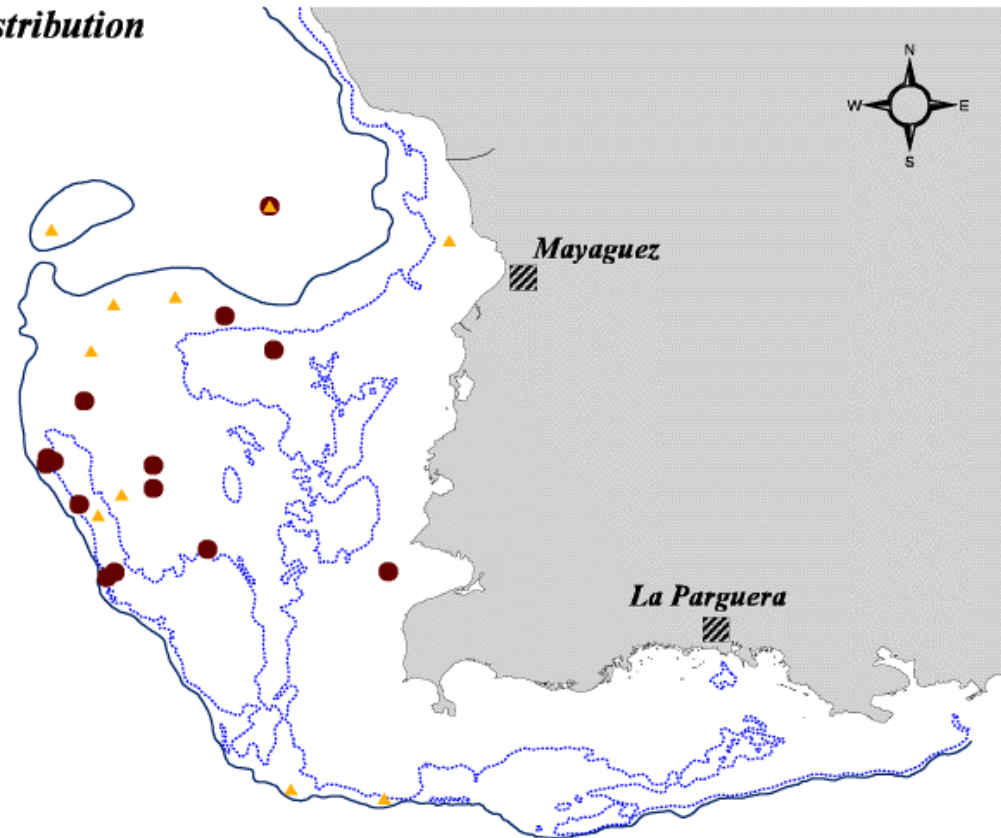
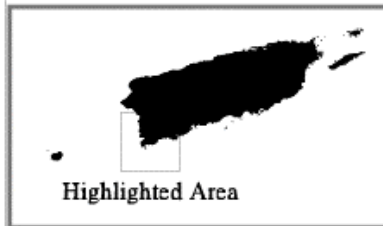
Yellowtail Snapper  
(*Ocyurus chrysurus*)

### Life Stage

- ▲ adult
- juvenile

### Bathymetry (Feet)

- 60
- 600



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## Adult and Juvenile Catch Distribution

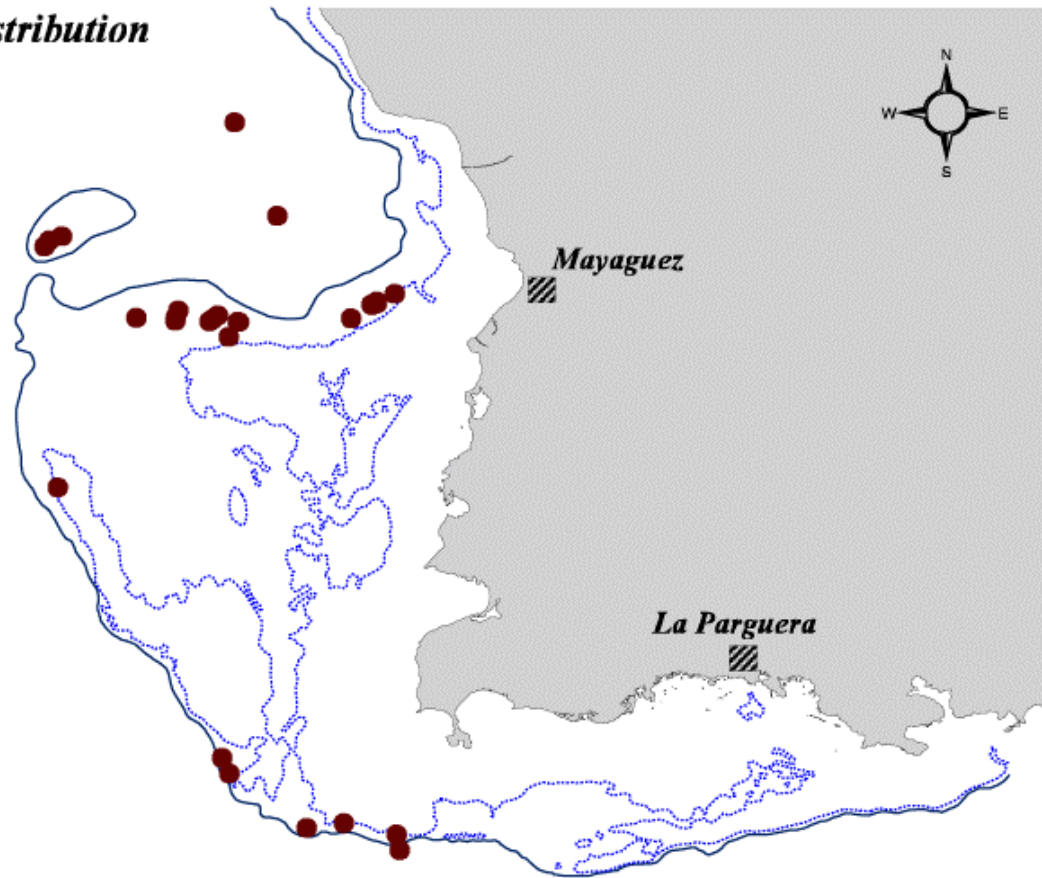
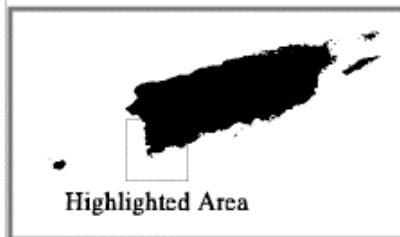
Silk Snapper  
(*Lutjanus vivanus*)

### Life Stage

- ▲ adult
- juvenile

### Bathymetry (Feet)

- 60
- 600



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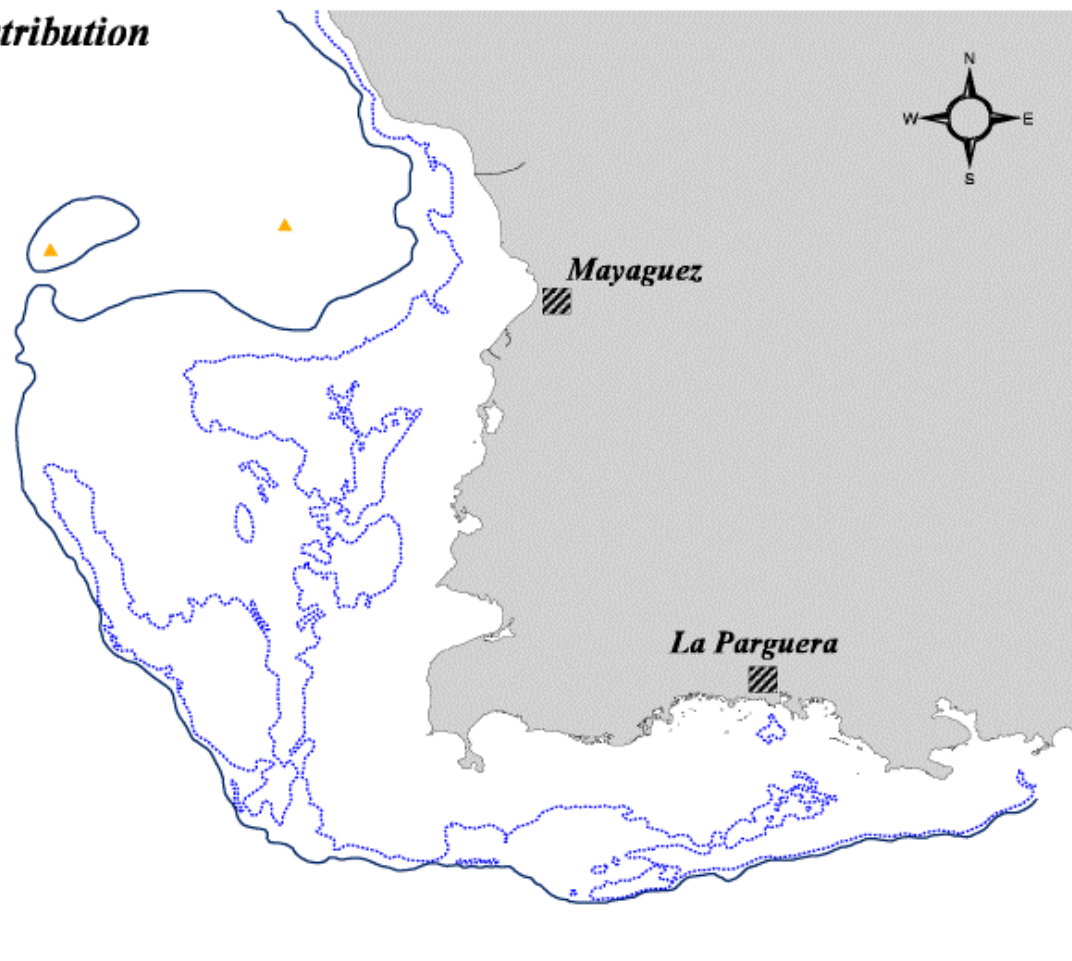
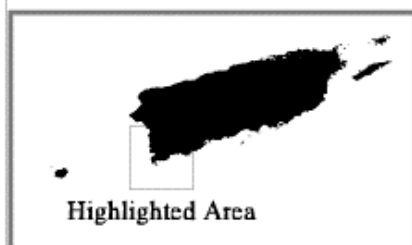
Data Provided by Puerto Rico DNER  
and NMFS/SEAMAP

## Adult and Juvenile Catch Distribution

Schoolmaster  
(*Lutjanus apodus*)

**Life Stage**  
▲ adult  
● juvenile

**Bathymetry (Feet)**  
60  
600



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July, 1998

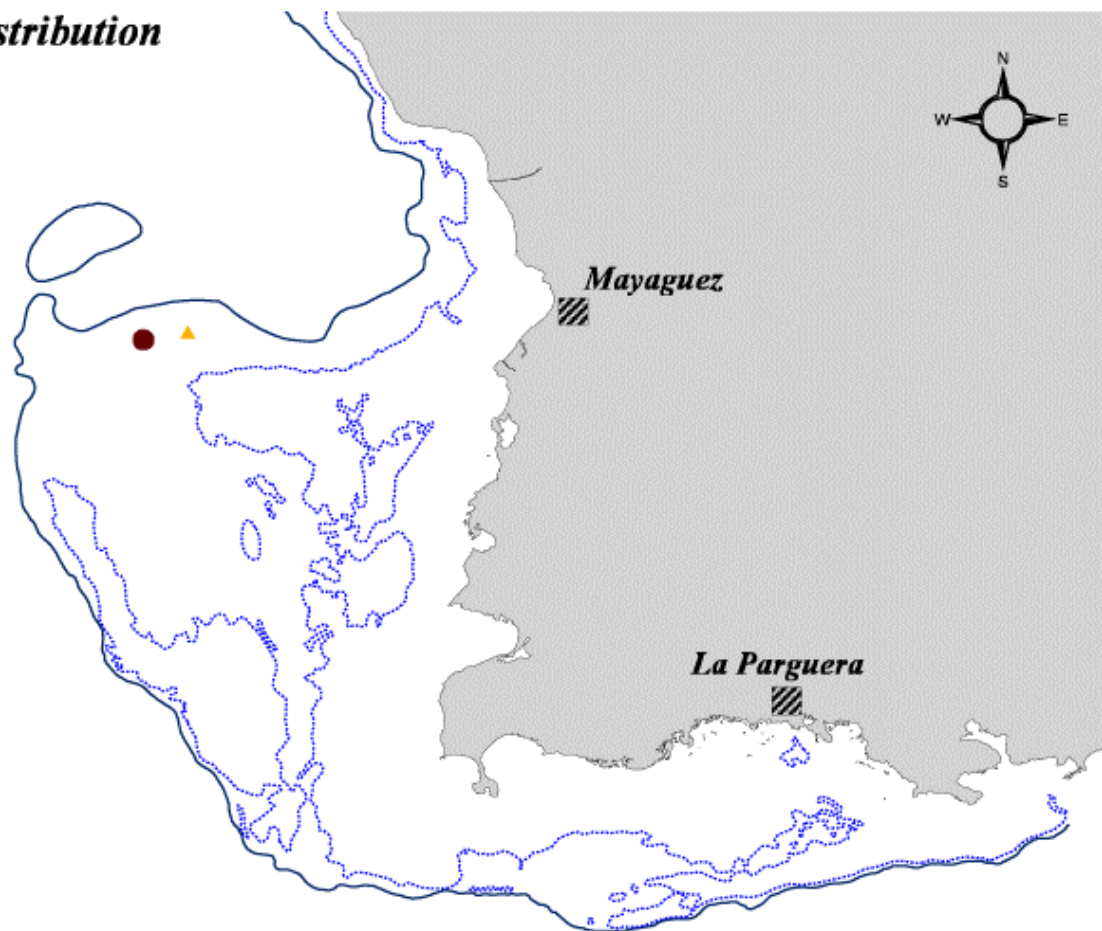
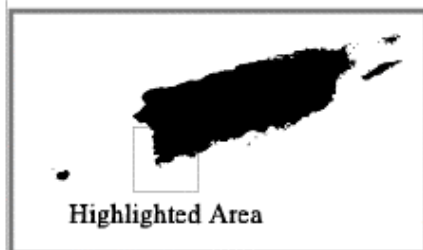
Data Provided by Puerto Rico DNER  
and NMFS/SEAMAP

## Adult and Juvenile Catch Distribution

Mutton Snapper  
(*Lutjanus analis*)

**Life Stage**  
▲ adult  
● juvenile

**Bathymetry (Feet)**  
60  
600



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July, 1998

Data Provided by Puerto Rico DNER  
and NMFS/SEAMAP

## Adult and Juvenile Catch Distribution

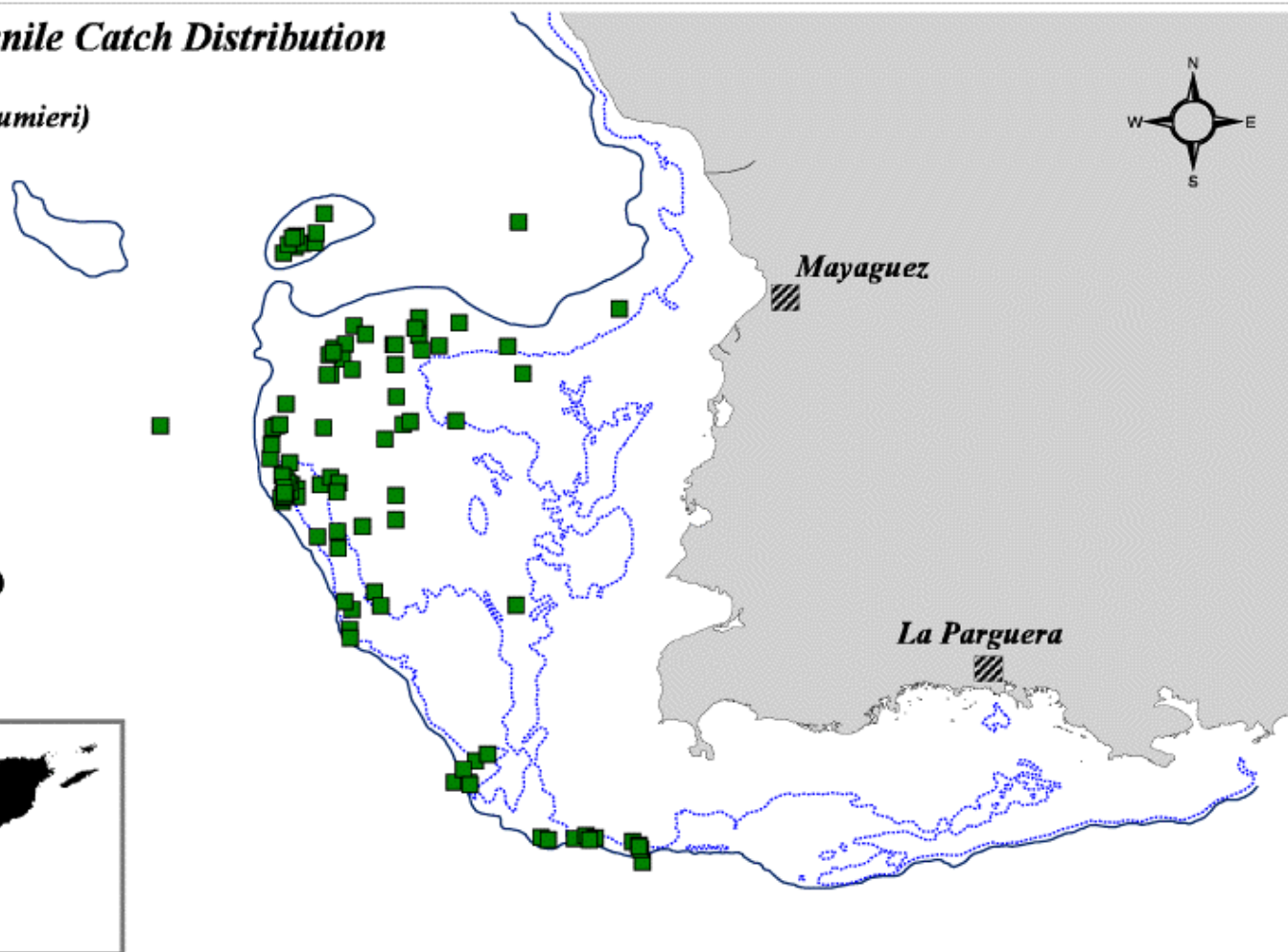
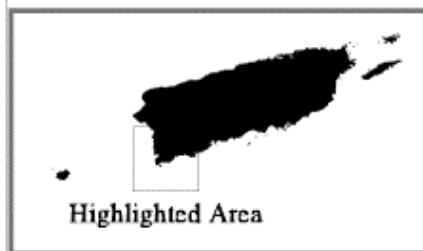
Sand Tilefish  
(*Molocanthus plumieri*)

### Life Stage

- ▲ adult
- juvenile
- unknown

### Bathymetry (Feet)

- 60
- 600



Prepared by NOS/SEA Division  
For the Caribbean Fisheries Management Council  
July, 1998

Data Provided by Puerto Rico DNER  
and NMFS/SEAMAP

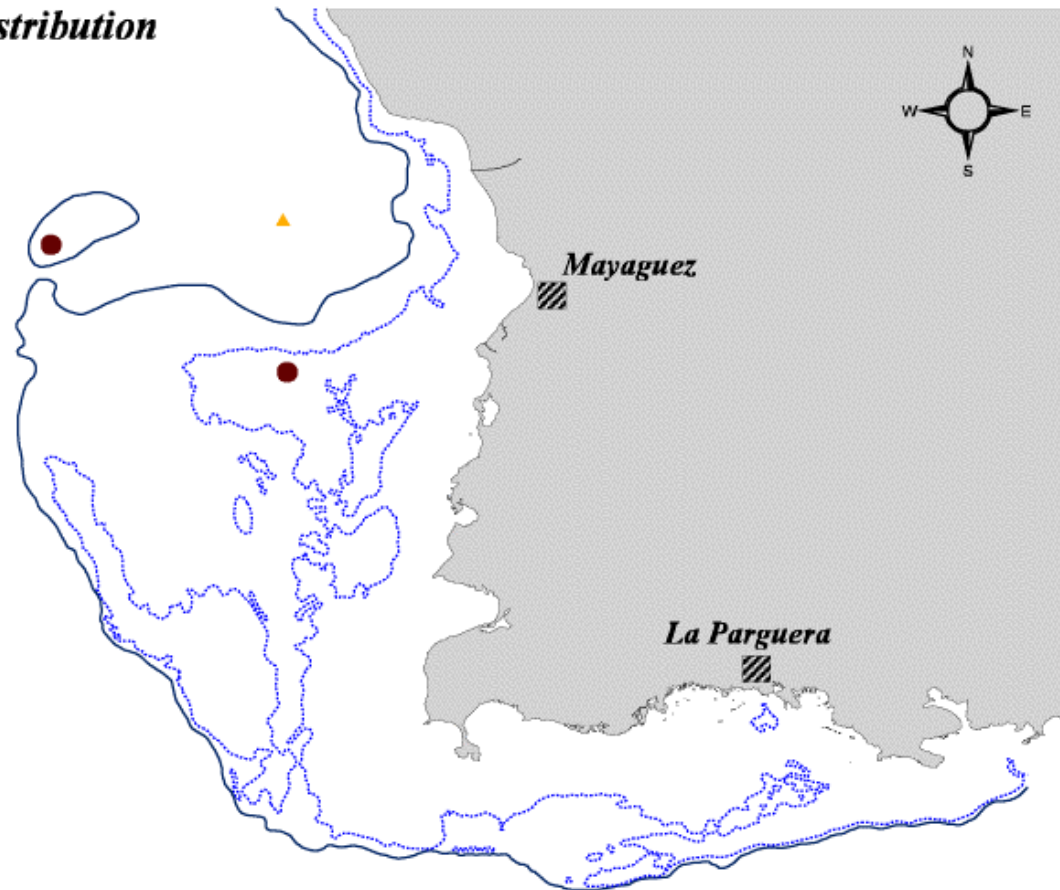
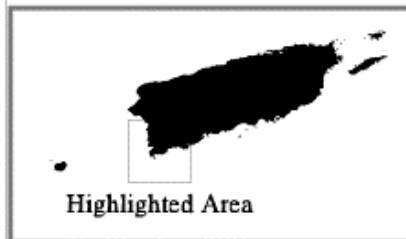


## Adult and Juvenile Catch Distribution

Nassau Grouper  
(*Epinephelus striatus*)

**Life Stage**  
▲ adult  
● juvenile

**Bathymetry (Feet)**  
60  
600



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July, 1998

Data Provided by Puerto Rico DNER  
and NMFS/SEAMAP

## Adult and Juvenile Catch Distribution

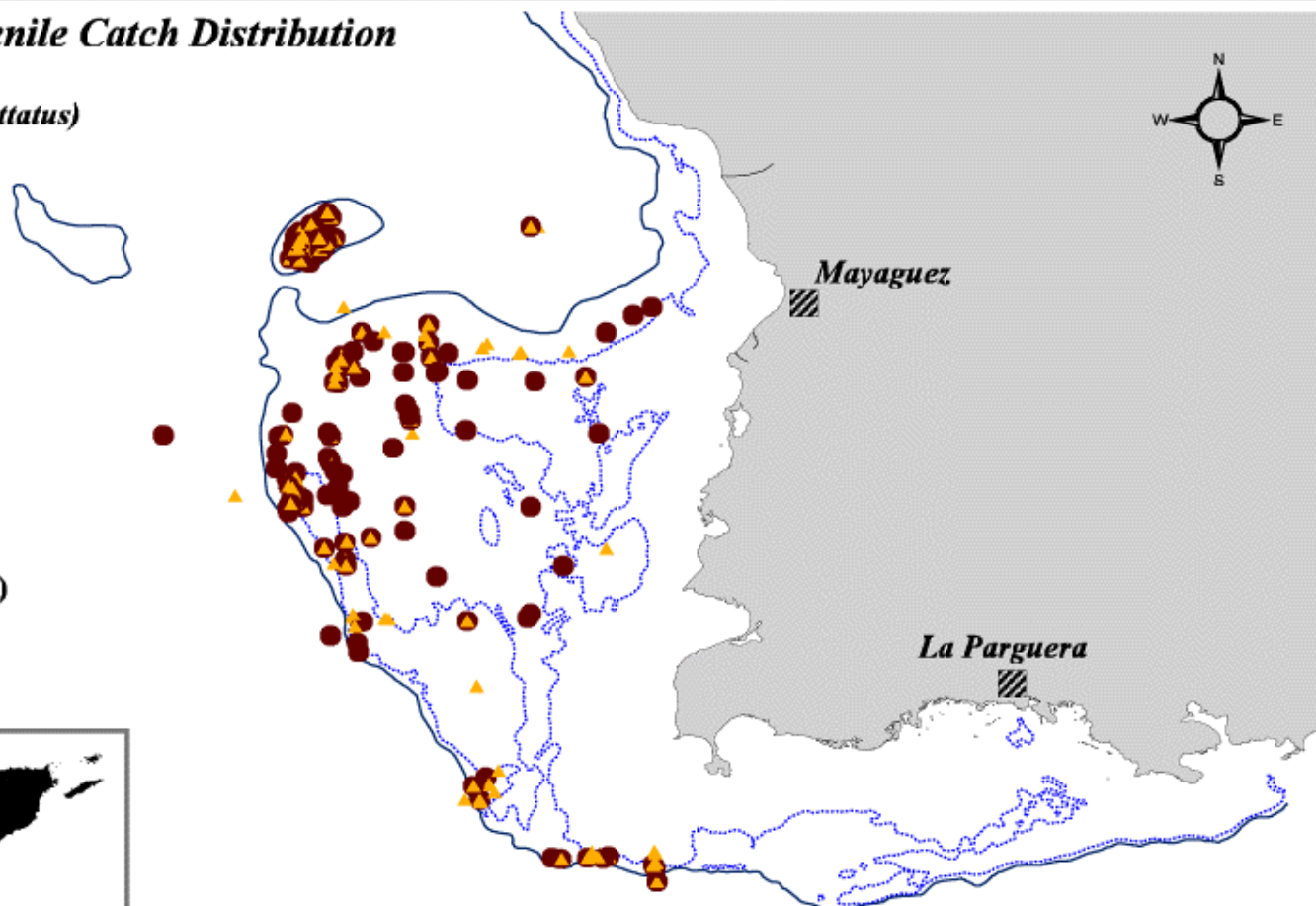
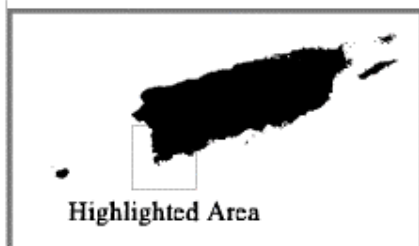
**Red Hind**  
(*Epinephelus guttatus*)

### Life Stage

- ▲ adult
- juvenile

### Bathymetry (Feet)

- 60
- 600



Prepared by NOS/SEA Division  
For the Caribbean Fisheries Management Council  
July, 1998

Data Provided by Puerto Rico DNER  
and NMFS/SEAMAP

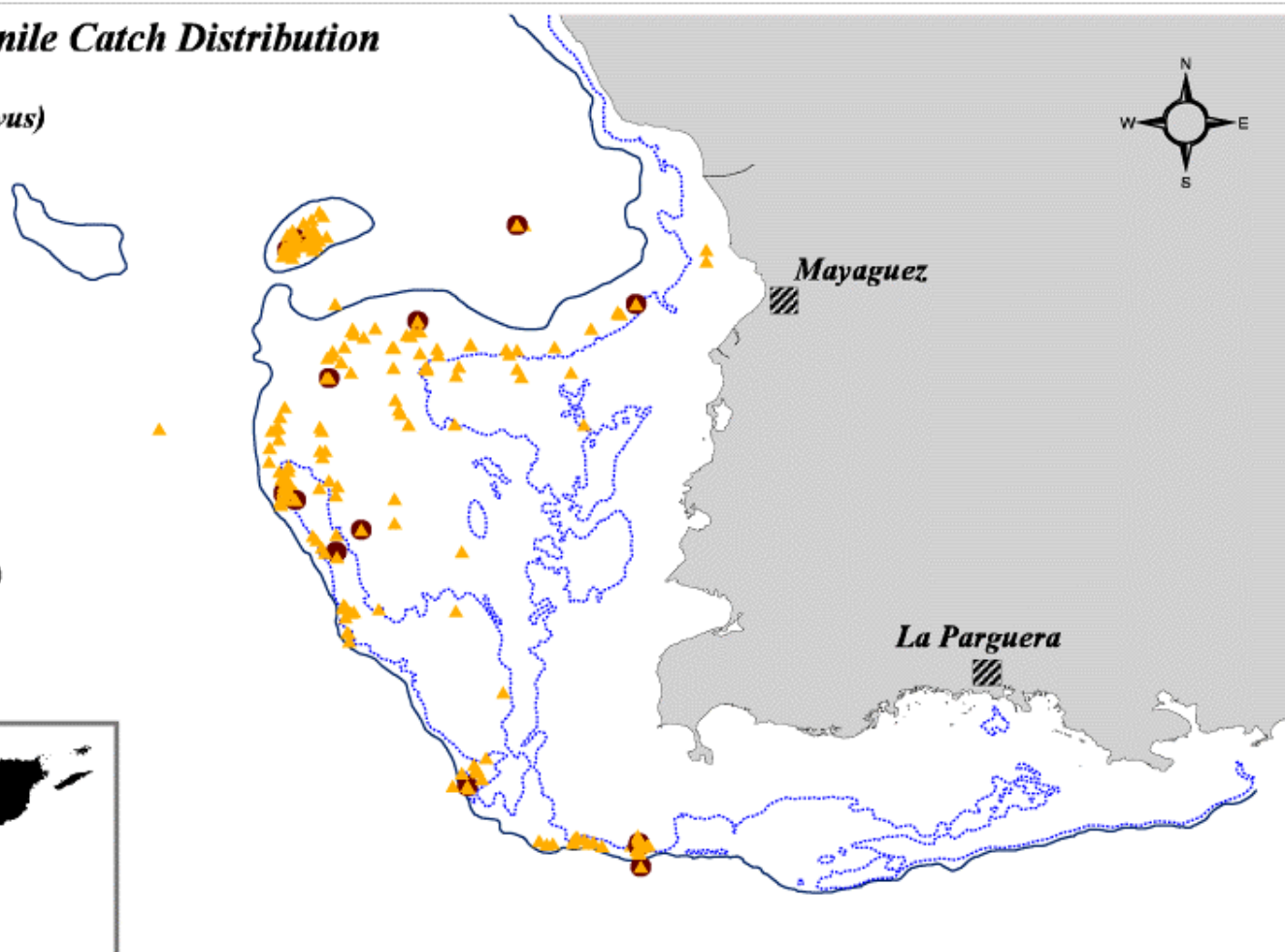
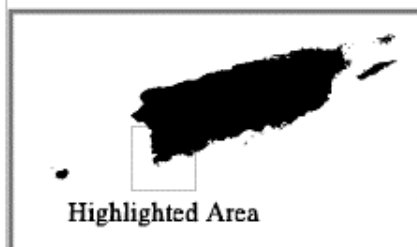
## Adult and Juvenile Catch Distribution

Coney  
(*Epinephelus fulvus*)

### Life Stage

- ▲ adult
- juvenile

### Bathymetry (Feet)



Prepared by NOS/SEA Division  
For the Caribbean Fisheries Management Council  
July, 1998

Data Provided by Puerto Rico DNER  
and NMFS/SEAMAP



## Adult and Juvenile Catch Distribution

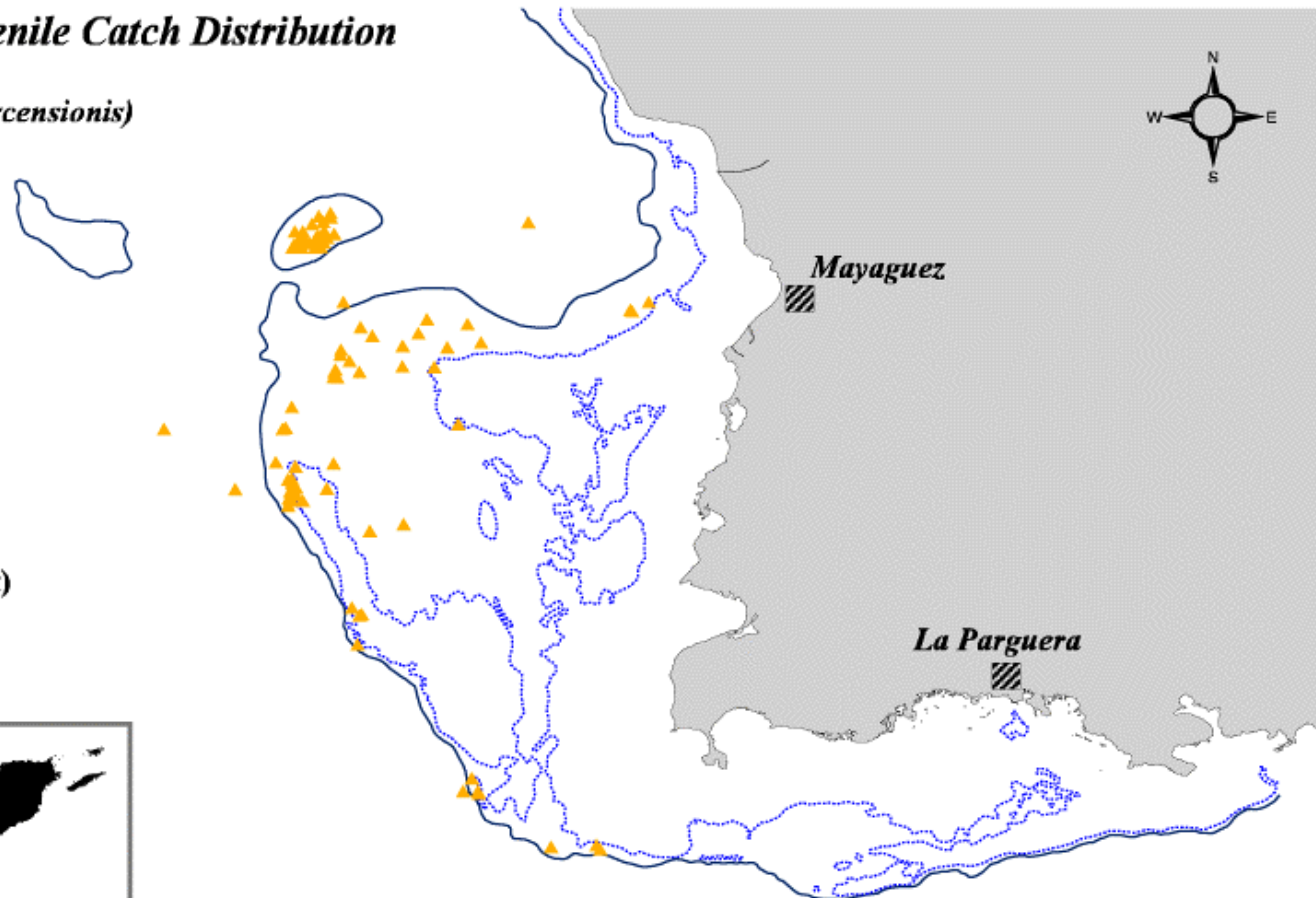
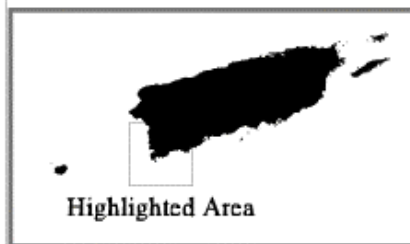
Squirrelfish  
(*Holocentris adscensionis*)

### Life Stage

- ▲ adult
- juvenile

### Bathymetry (Feet)

- 60
- 600



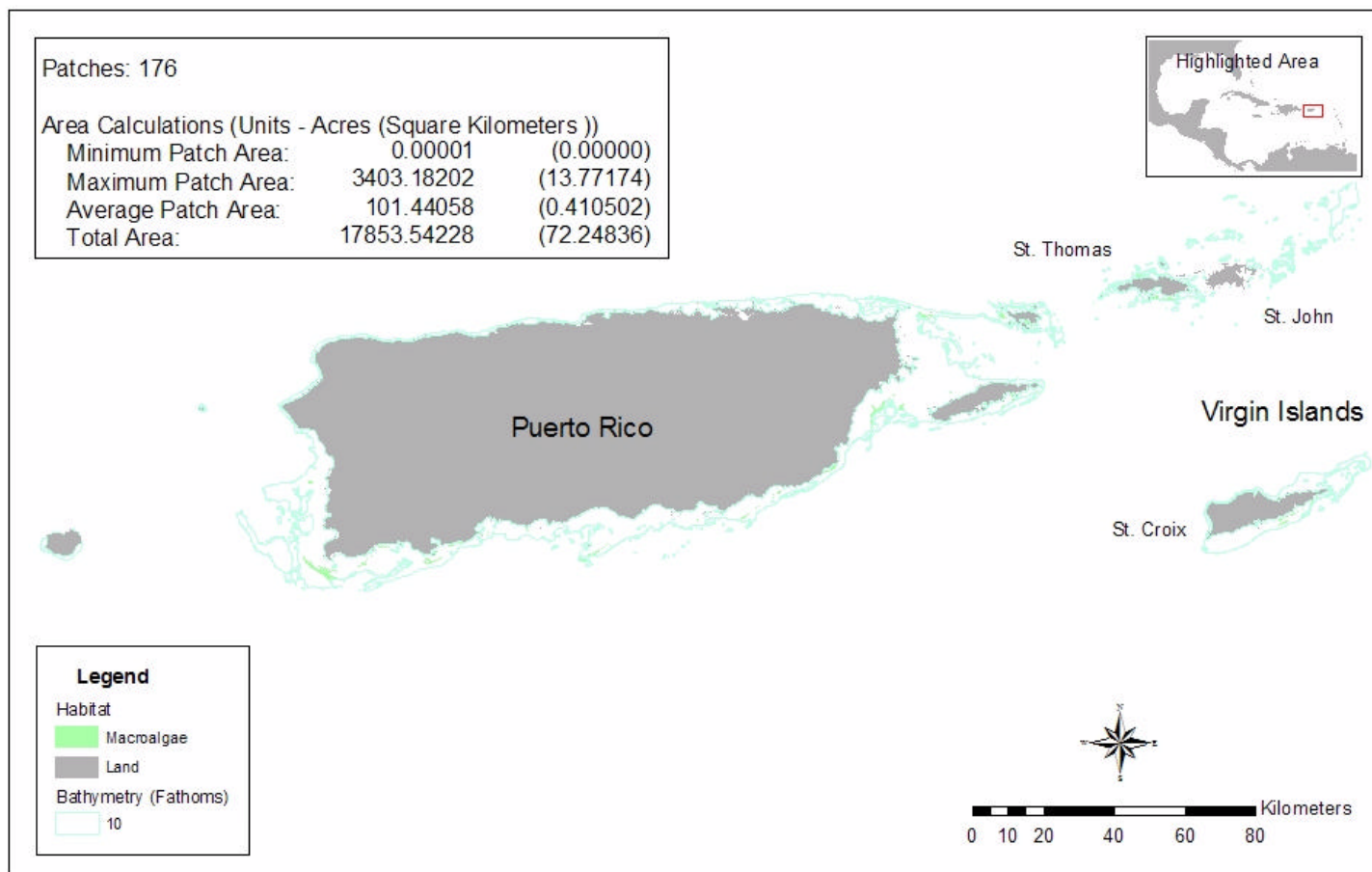
Prepared by NOS/SEA Division  
For the Caribbean Fisheries Management Council  
July, 1998

Data Provided by Puerto Rico DNER  
and NMFS/SEAMAP

## Appendix 5. Distributional statistics of benthic habitats from NOS mapping

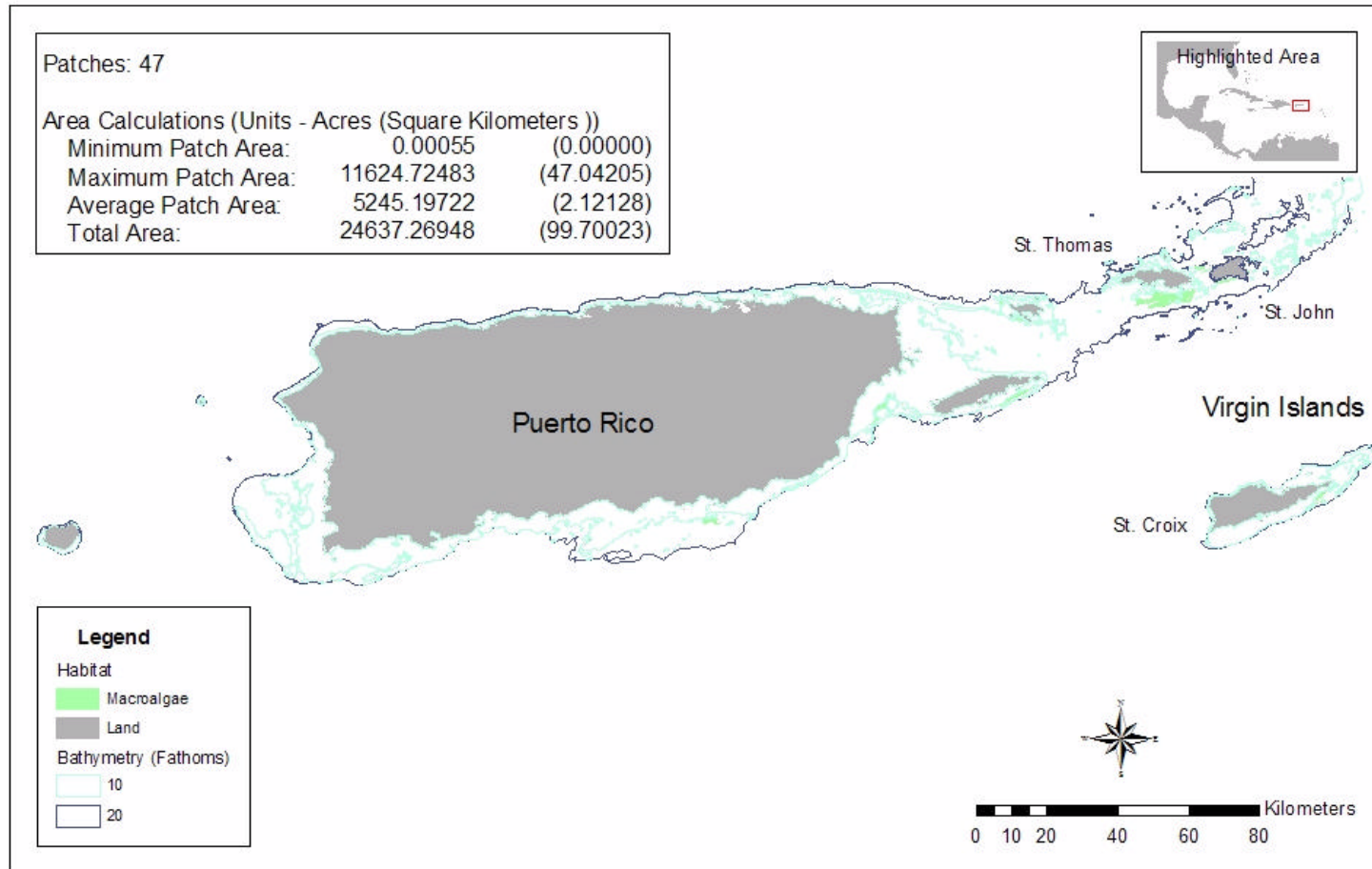
## Habitat Statistics by Bathymetric Regime

Macroalgae (0 - 10 Fathoms)



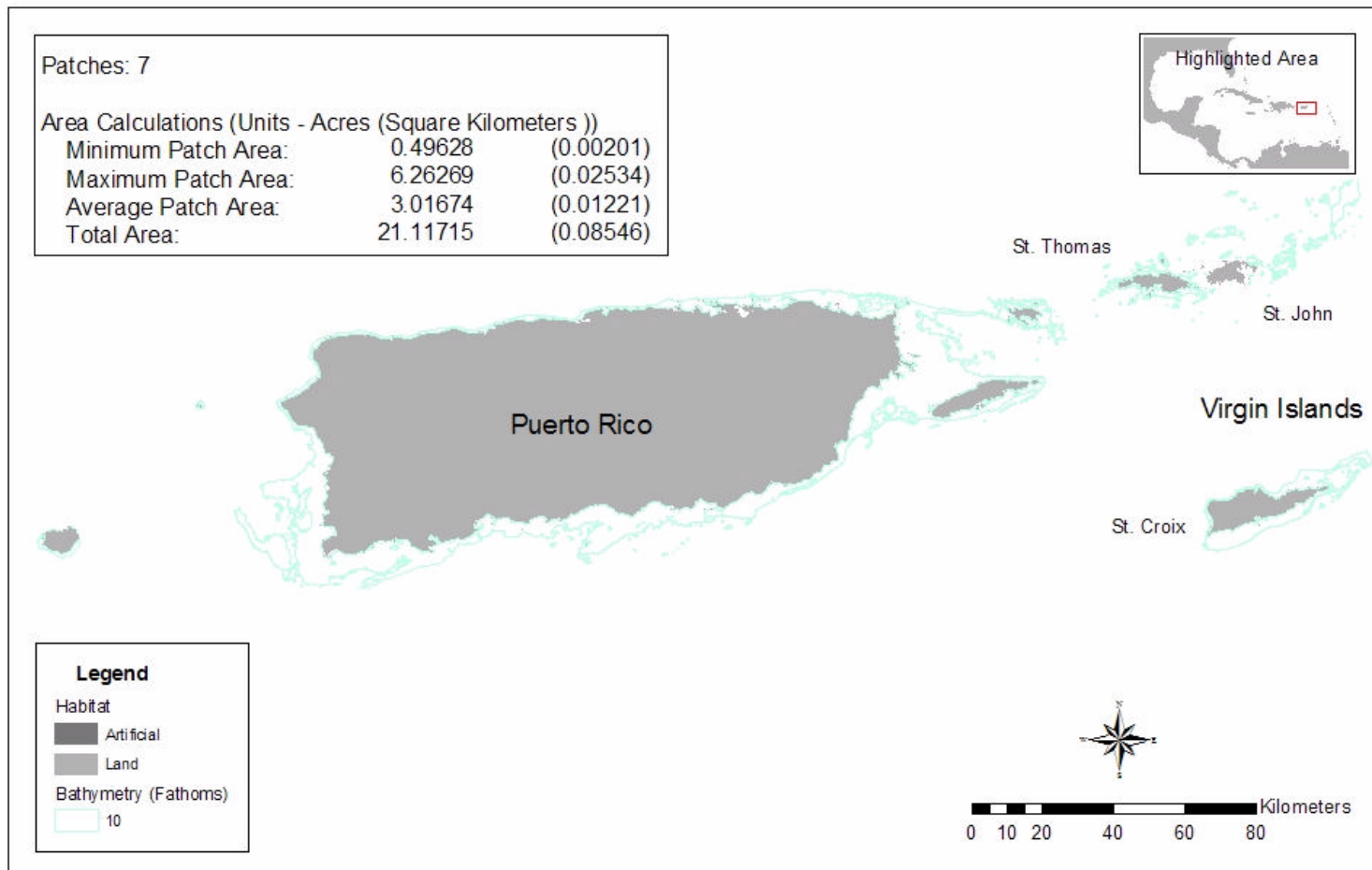
## Habitat Statistics by Bathymetric Regime

Macroalgae (10 - 20 Fathoms)



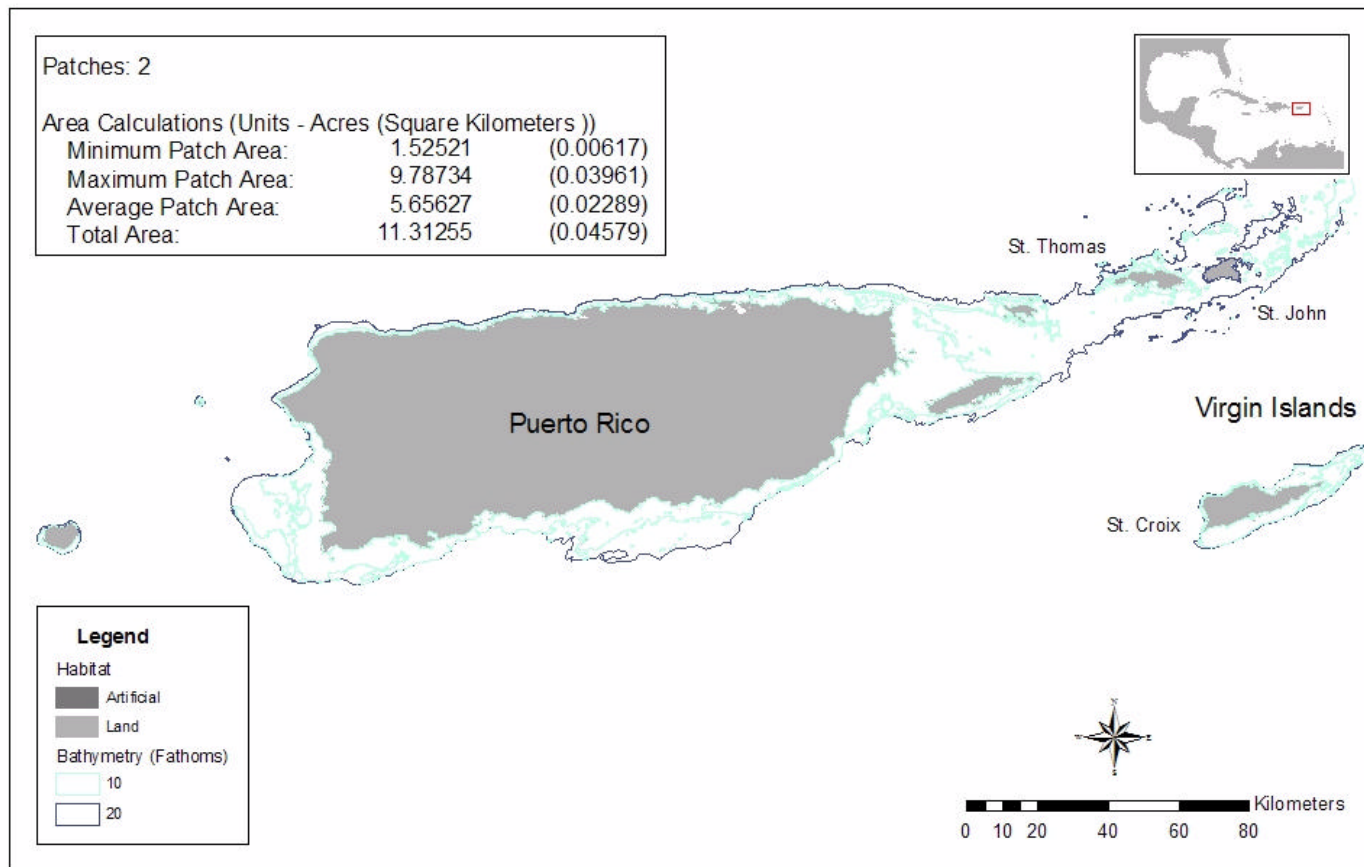
## Habitat Statistics by Bathymetric Regime

Artificial (0 - 10 Fathoms)



## Habitat Statistics by Bathymetric Regime

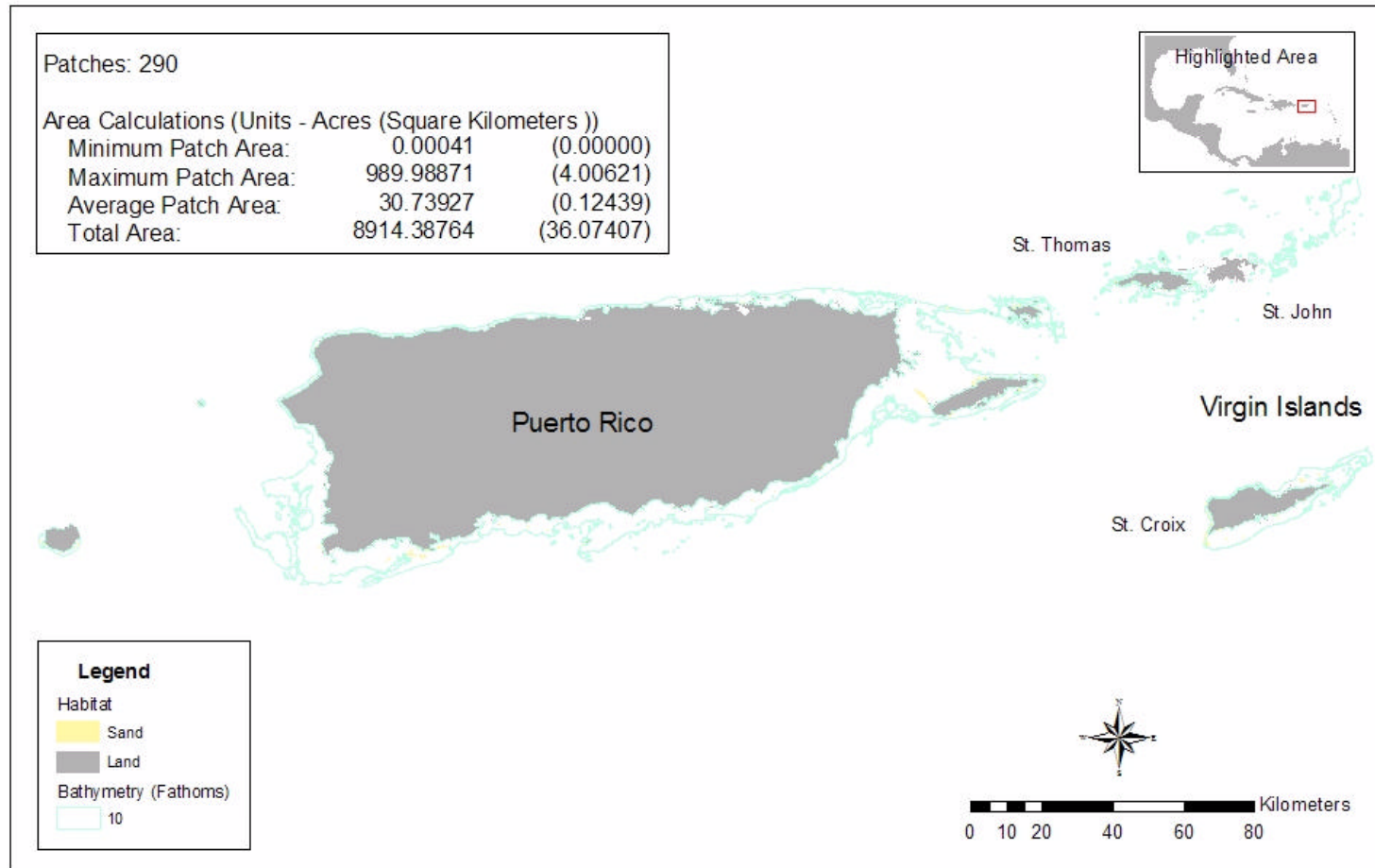
### Artificial (10 - 20 Fathoms)





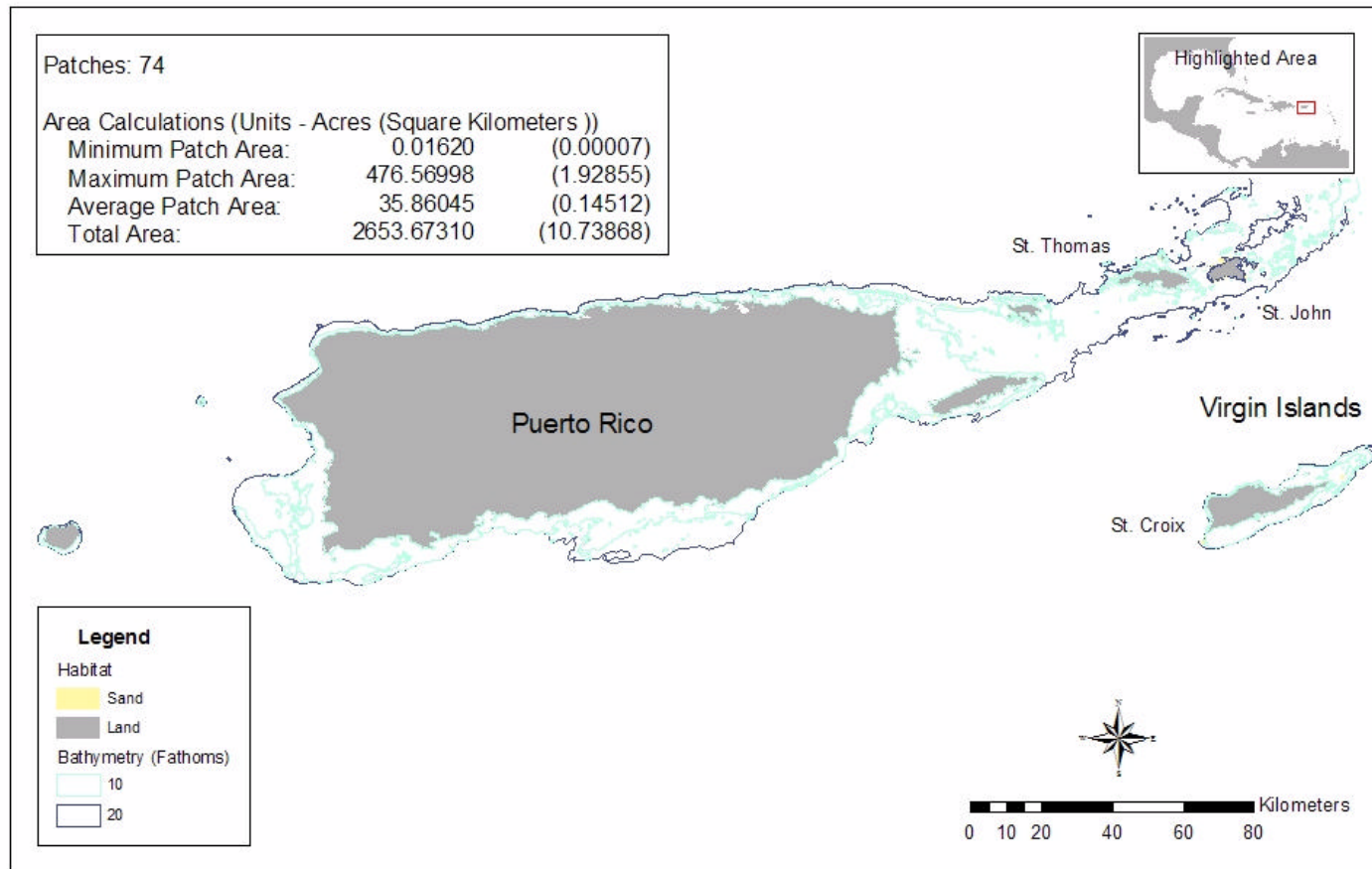
## Habitat Statistics by Bathymetric Regime

Sand (0 - 10 Fathoms)



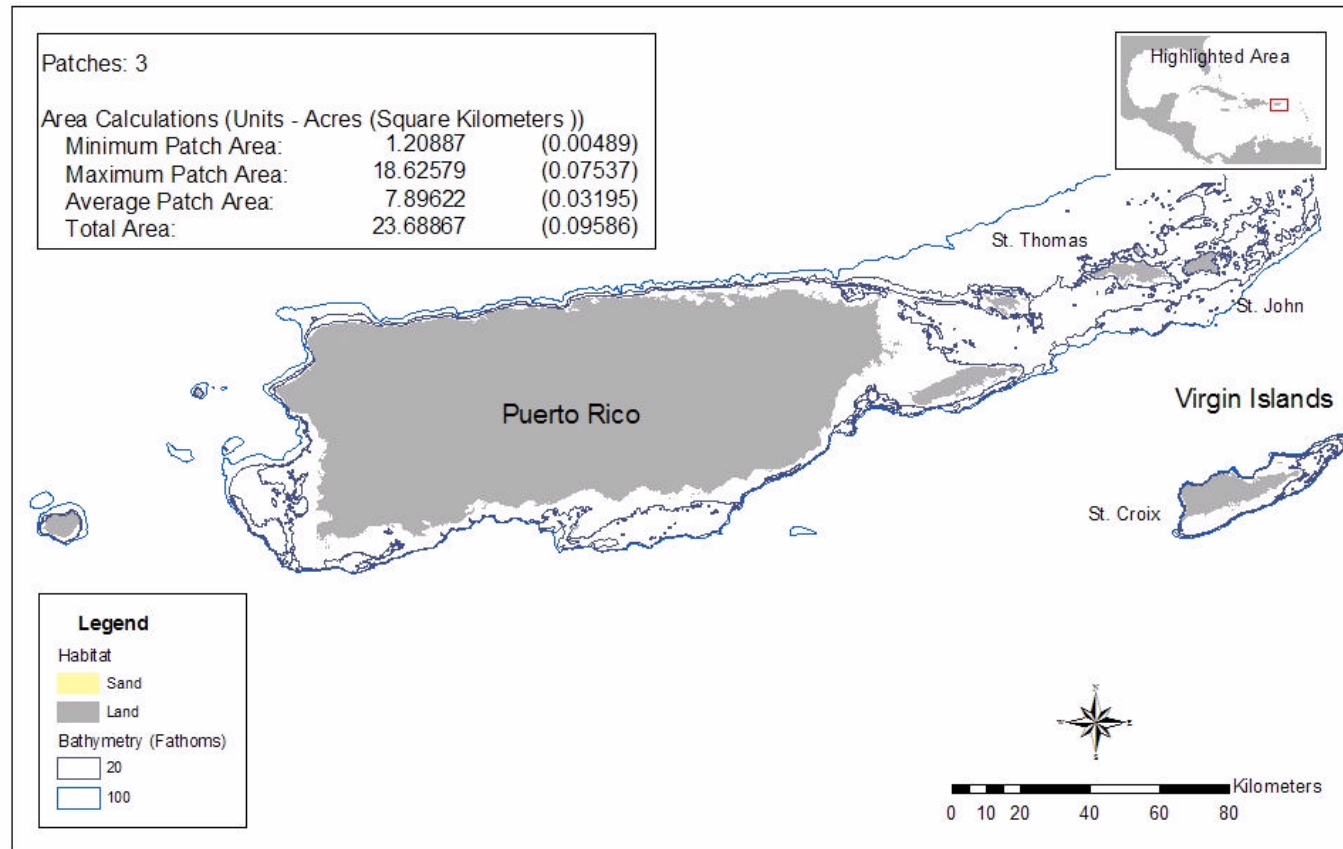
## Habitat Statistics by Bathymetric Regime

### Sand (10 - 20 Fathoms)



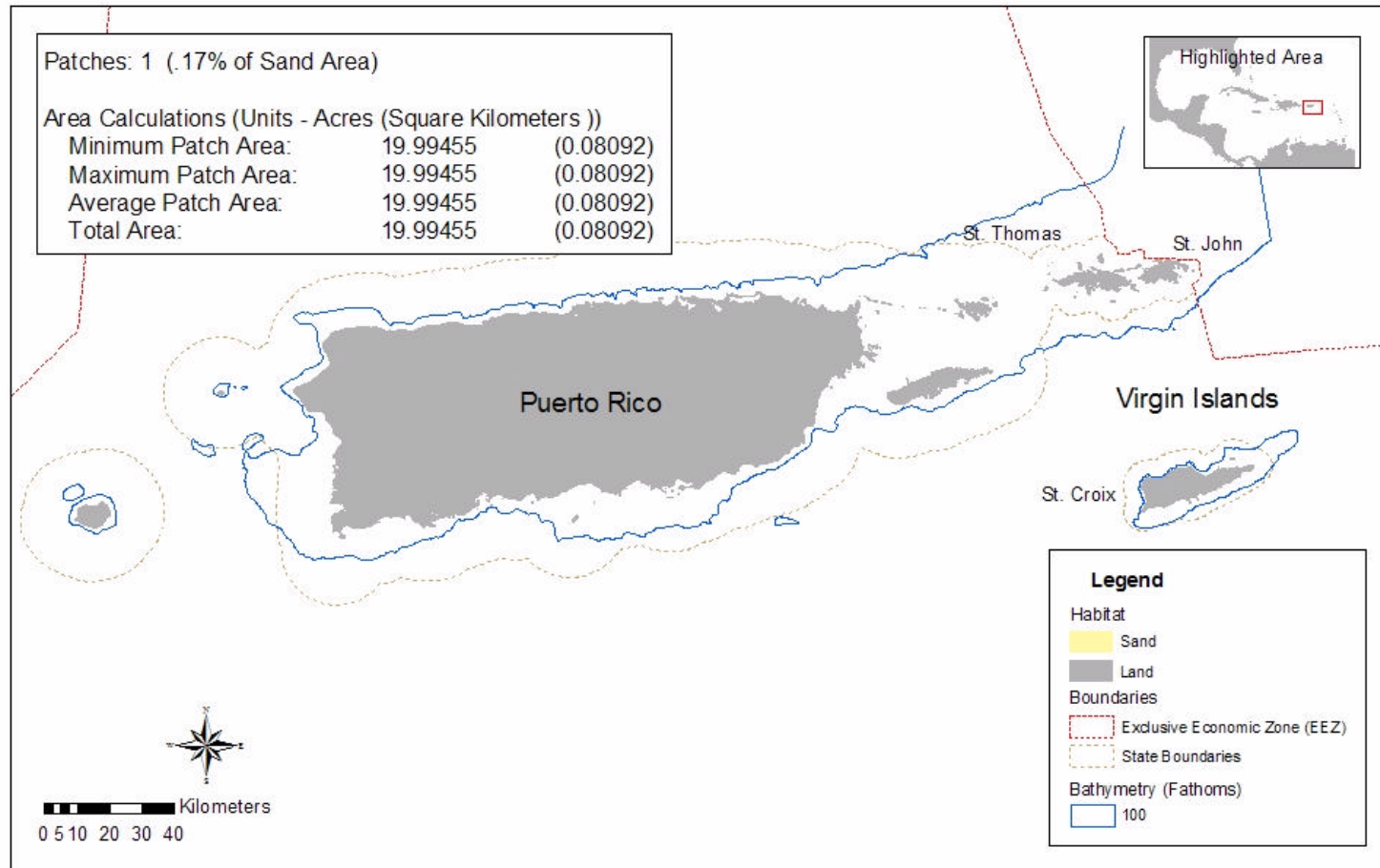
## Habitat Statistics by Bathymetric Regime

Sand (20 - 100 Fathoms)



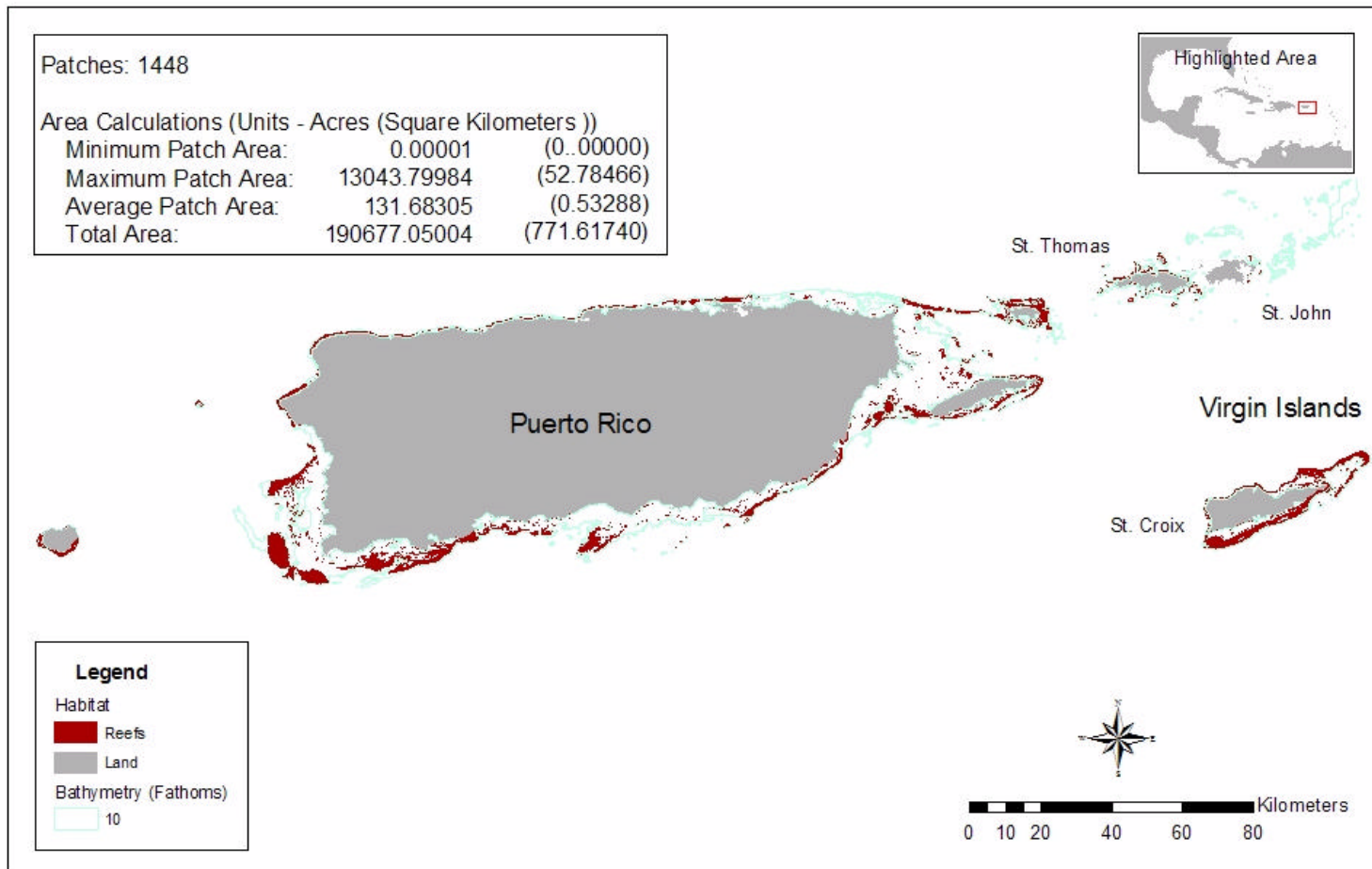
## Habitat Statistics within Federal Waters

### Sand



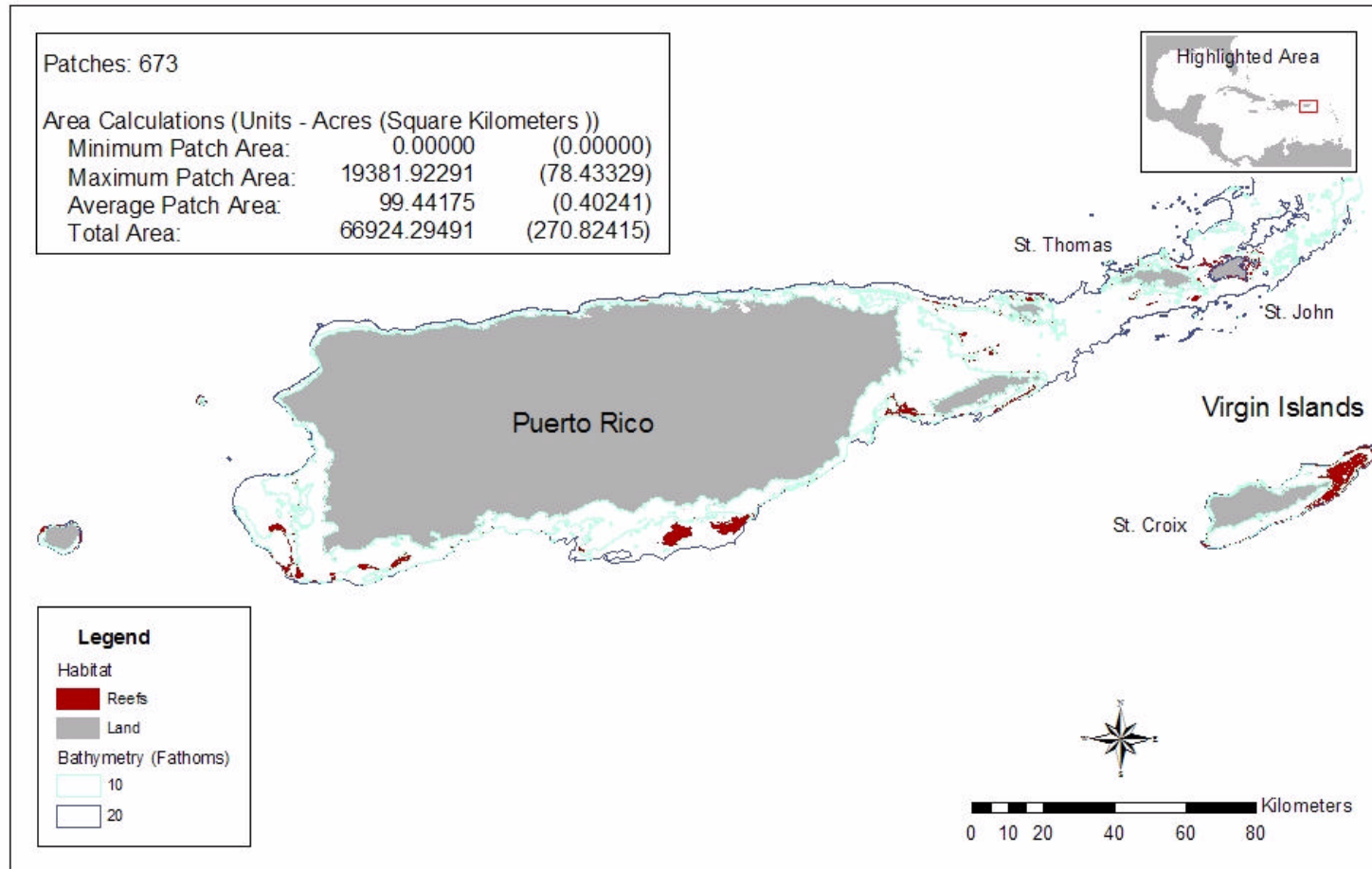
## Habitat Statistics by Bathymetric Regime

### Reefs (0 - 10 Fathoms)



## Habitat Statistics by Bathymetric Regime

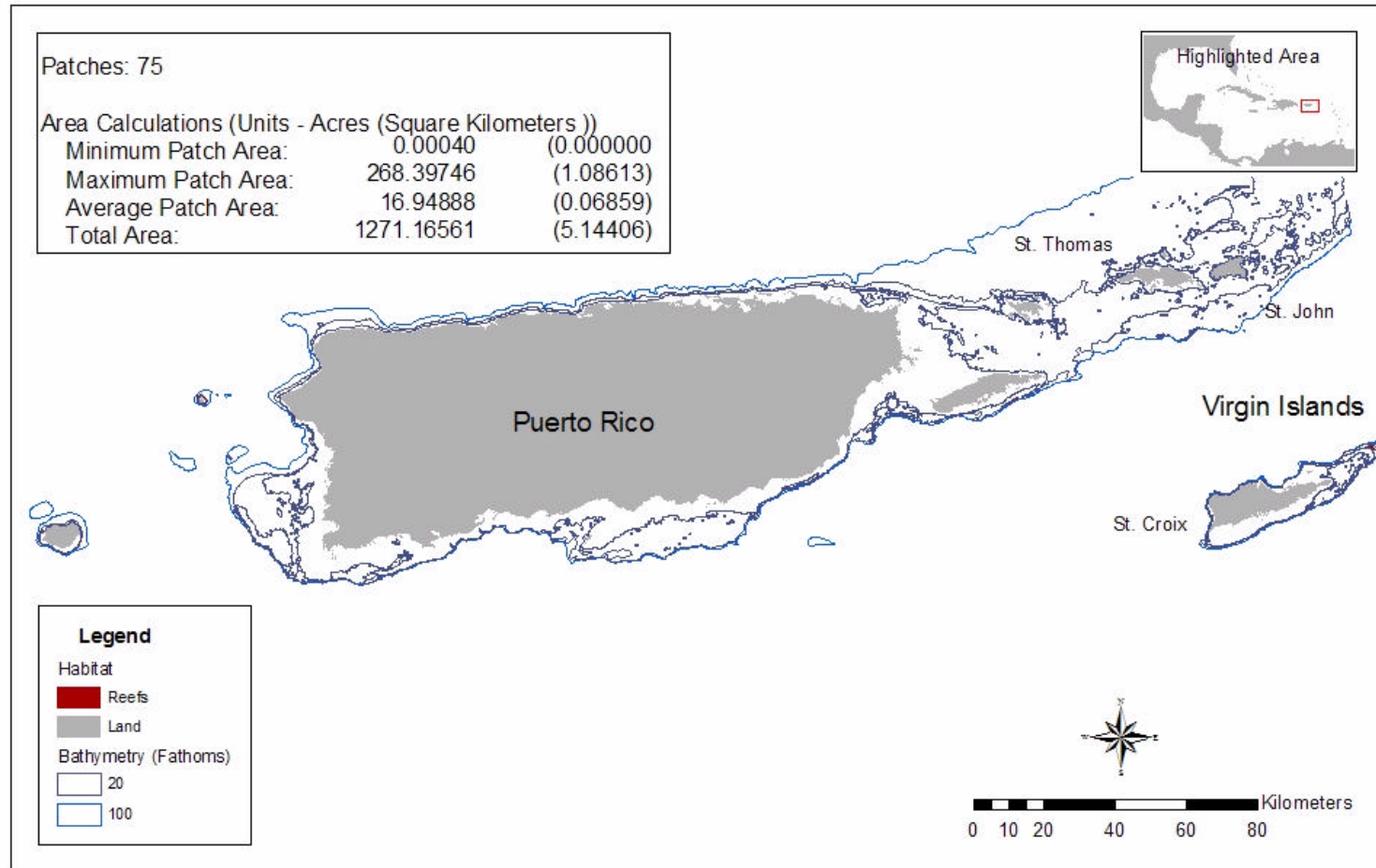
Reefs (10 - 20 Fathoms)



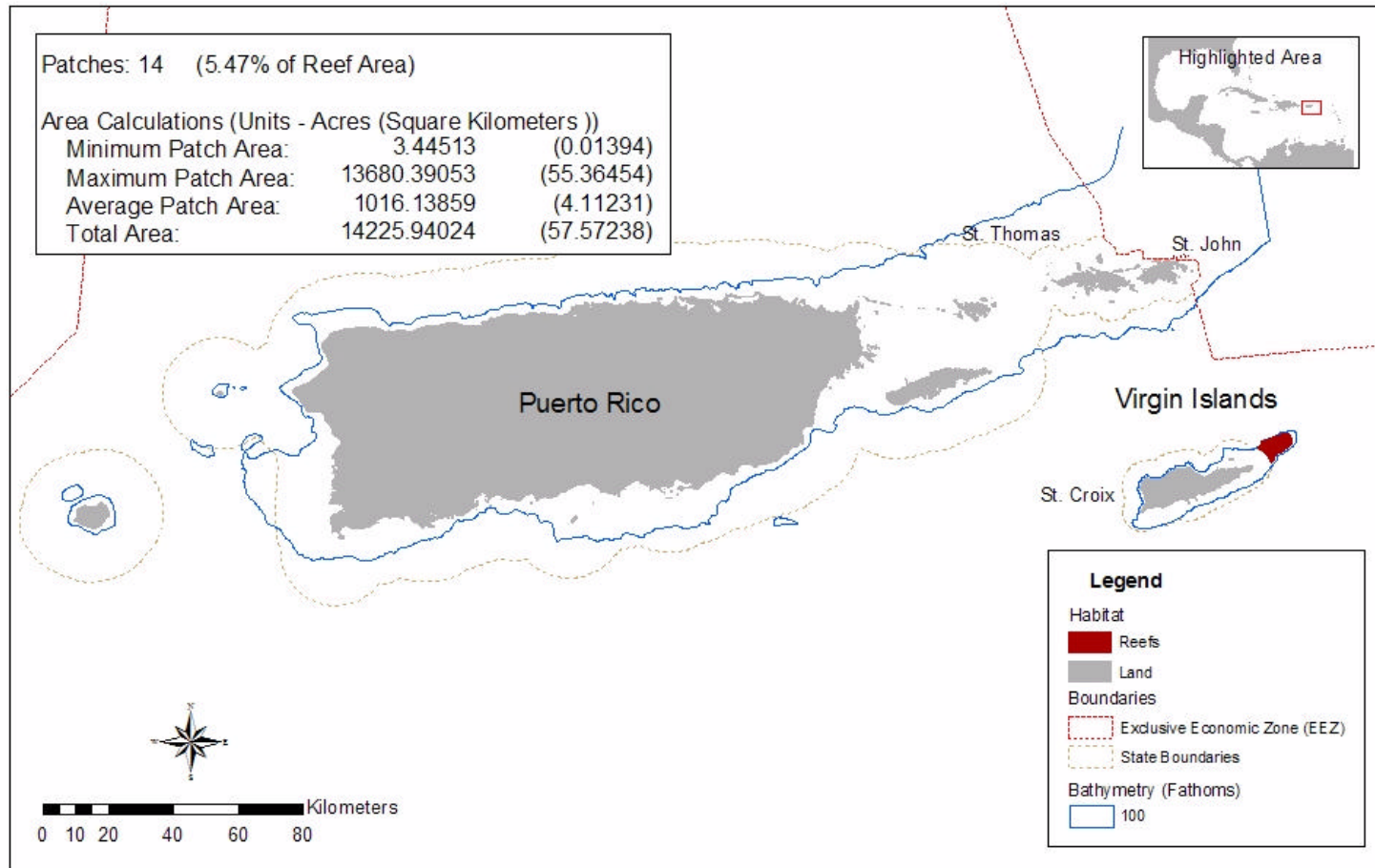


## Habitat Statistics by Bathymetric Regime

Reefs (20 - 100 Fathoms)

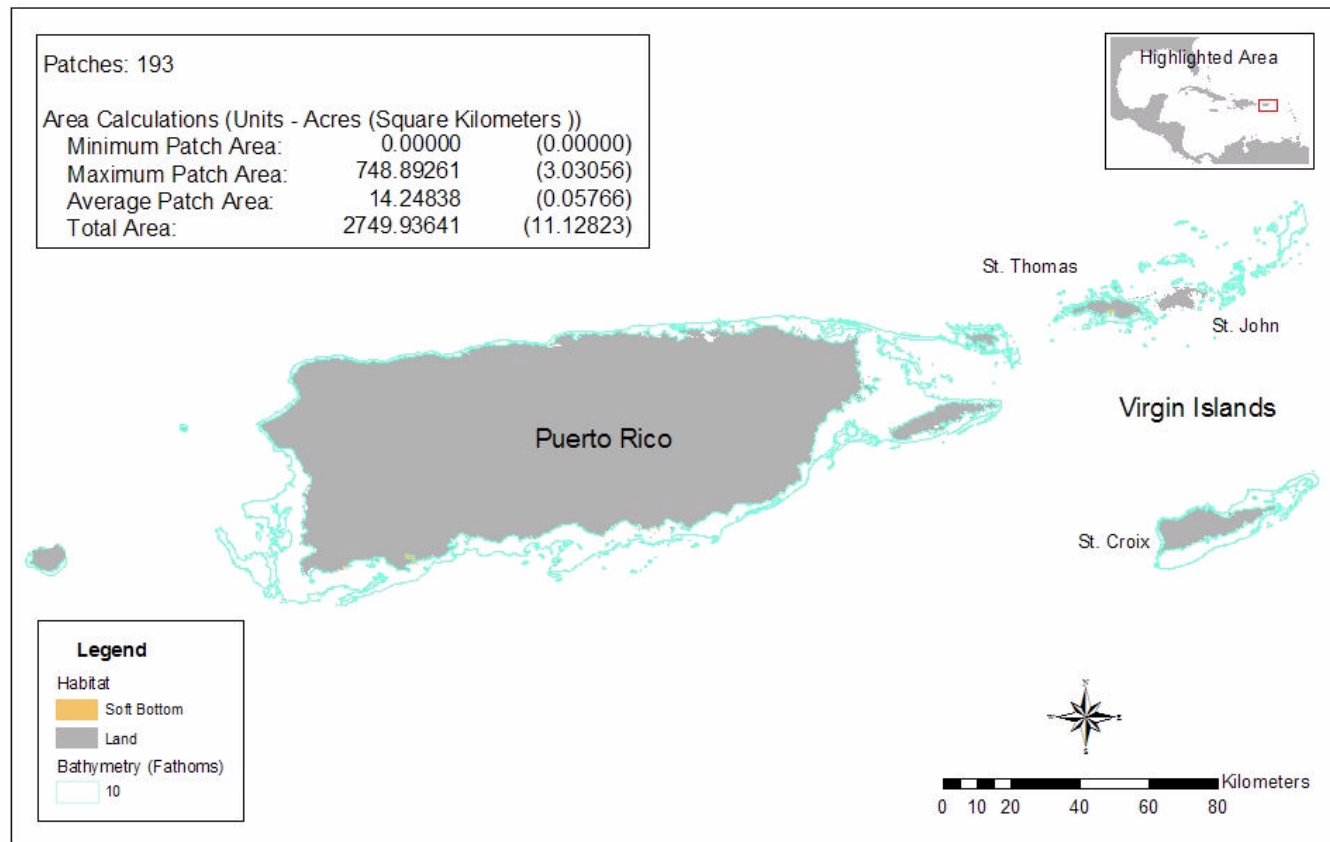


## Habitat Statistics within Federal Waters Reefs



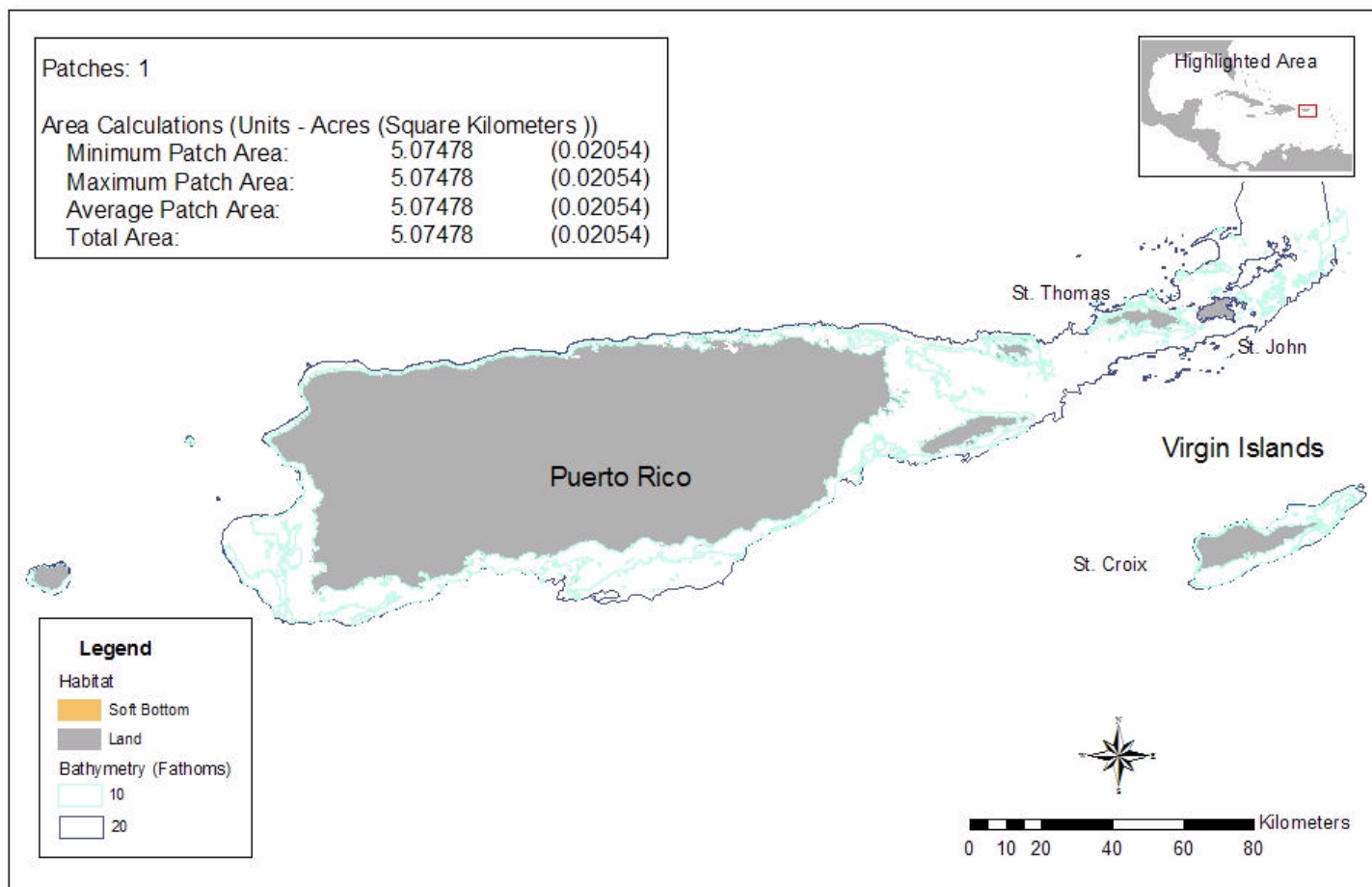
## Habitat Statistics by Bathymetric Regime

Soft Bottom (0 - 10 Fathoms)



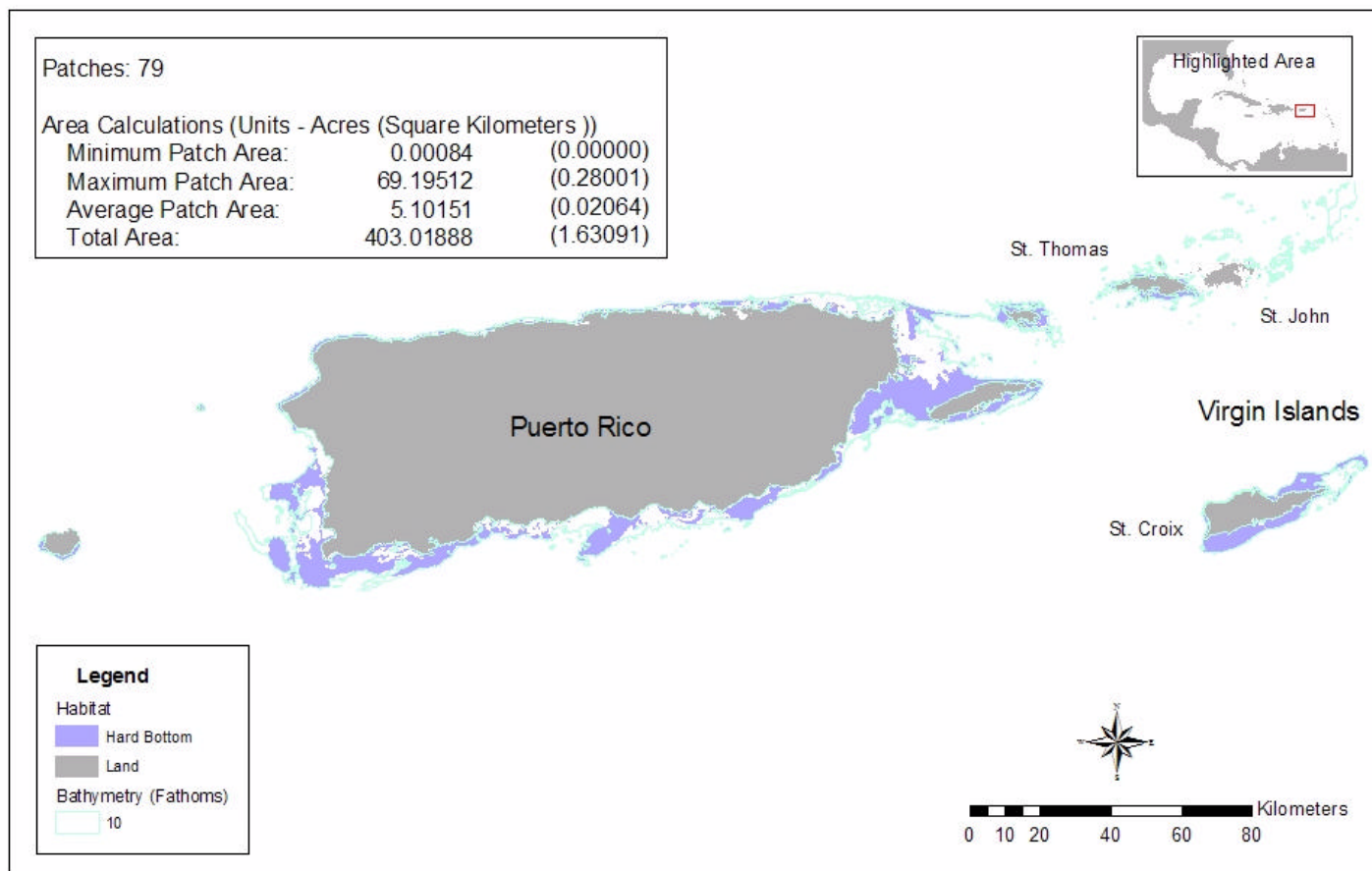
## Habitat Statistics by Bathymetric Regime

Soft Bottom (10 - 20 Fathoms)



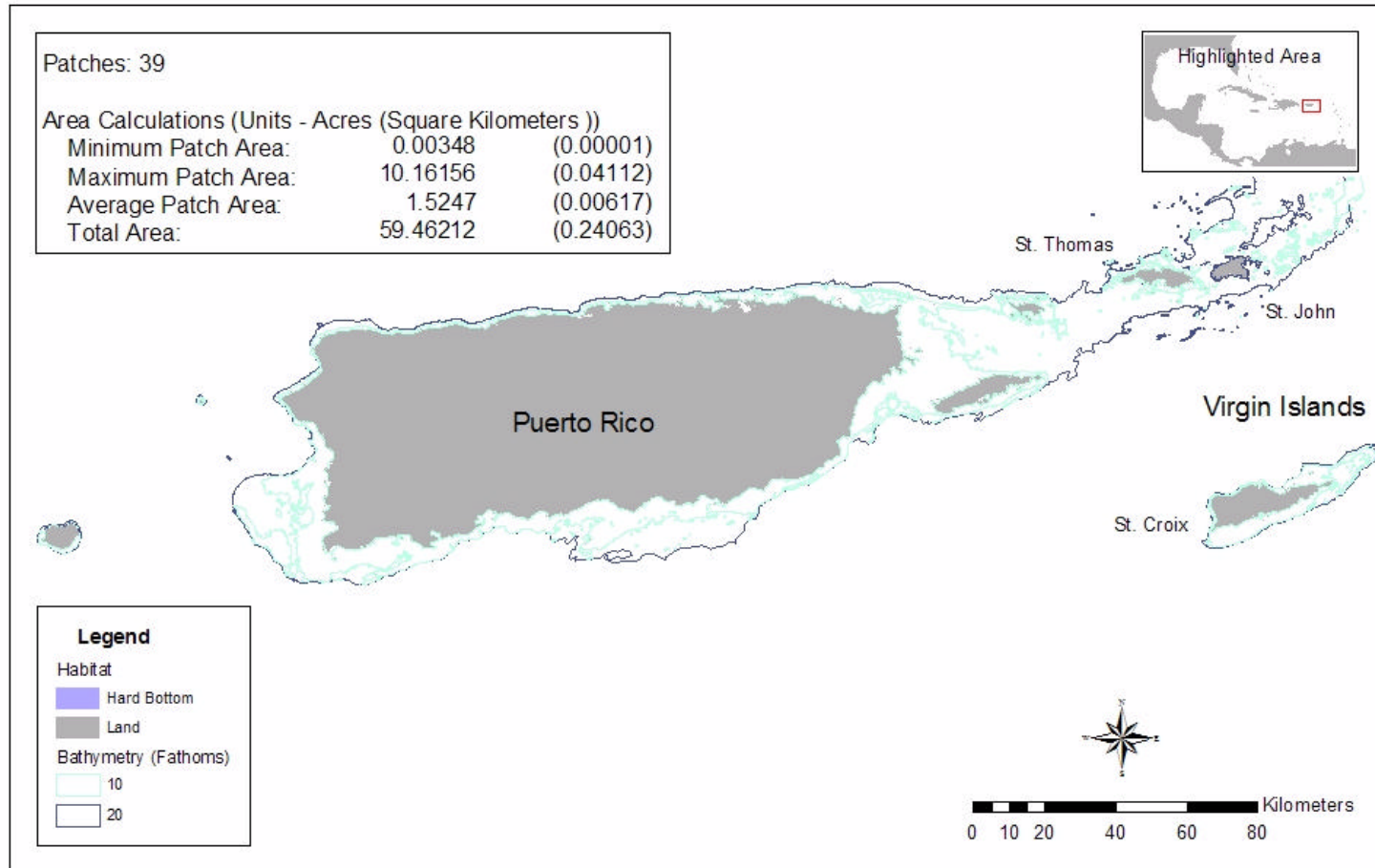
## Habitat Statistics by Bathymetric Regime

Hard Bottom (0 - 10 Fathoms)



## Habitat Statistics by Bathymetric Regime

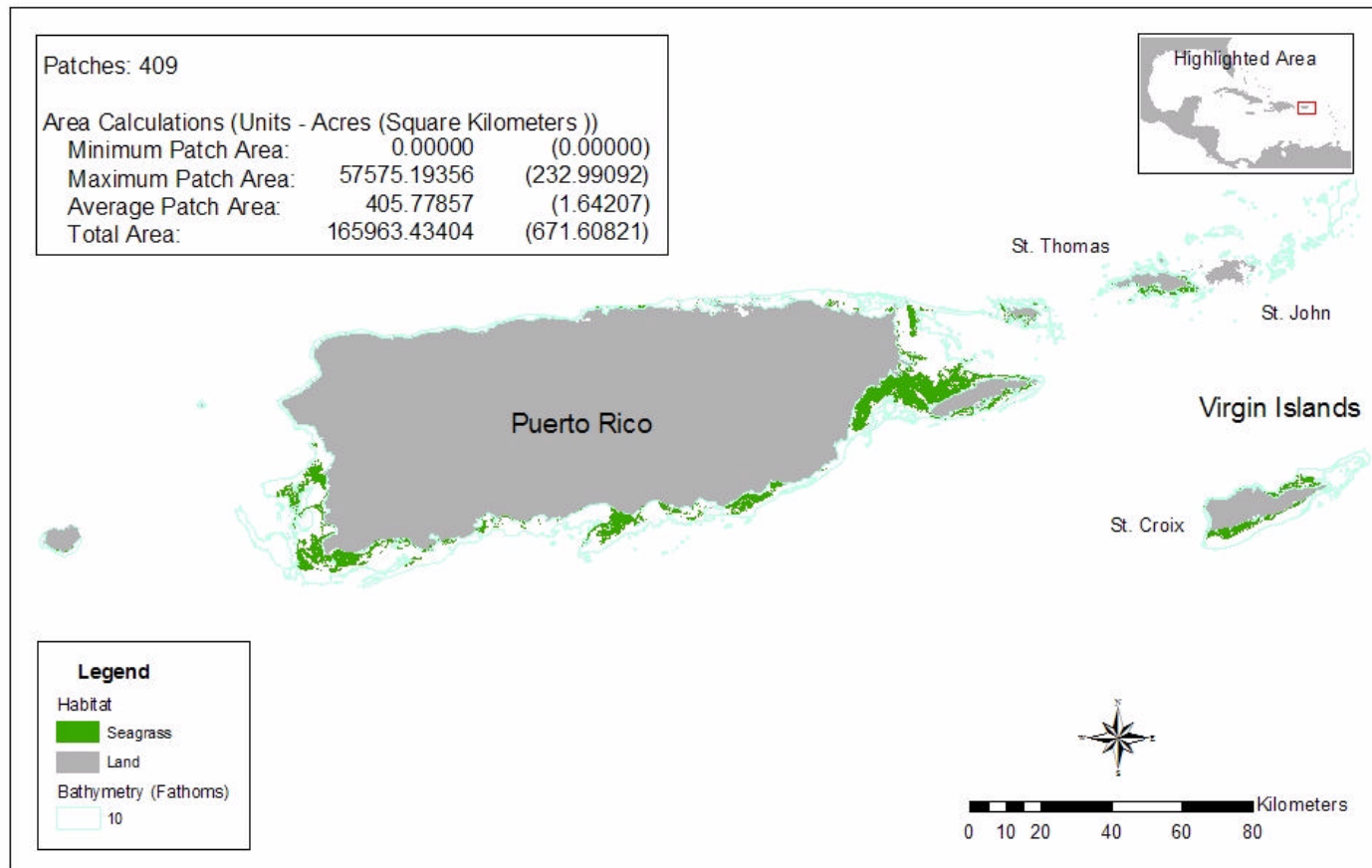
Hard Bottom (10 - 20 Fathoms)





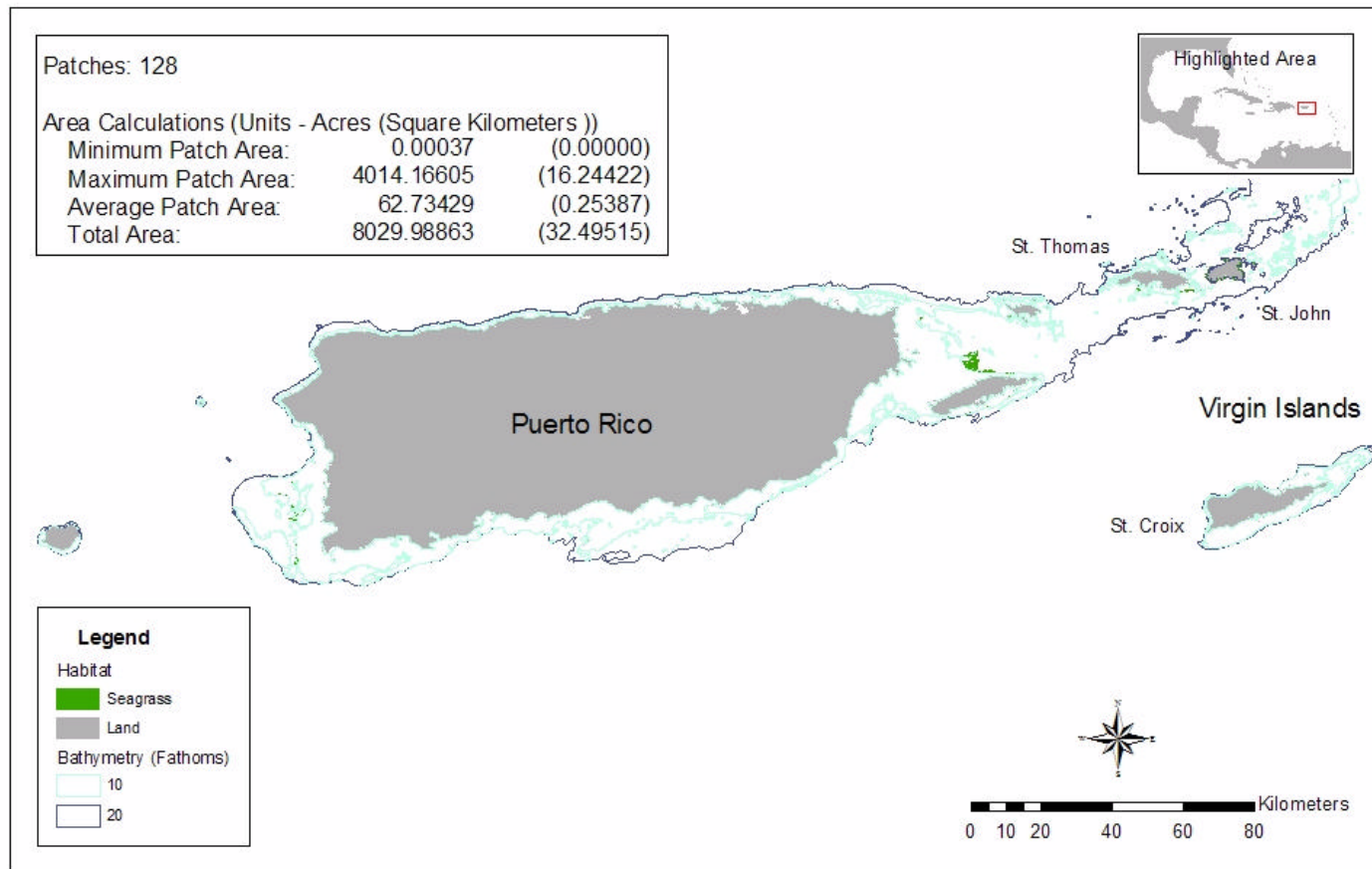
## Habitat Statistics by Bathymetric Regime

Seagrass (0 - 10 Fathoms)



## Habitat Statistics by Bathymetric Regime

### Seagrass (10 - 20 Fathoms)



## Appendix 6. Summary of Scoping Comments

The Council received three letters in response to the scoping announcement, and comments at six of the 10 scoping meetings, which are summarized as follows.

A letter from the Center for Marine Conservation (now the Ocean Conservancy) recommended:

- Evaluate a range of gear management options and express as proposed FMP amendments;
- Propose alternatives that include MPAs;
- Identify HAPC alternatives for key life stages for overfished stocks;
- Analyze direct and indirect impacts of fishing on each EFH;
- Categorize gear by impact on various habitats;
- Analyze gear impacts on species managed under other plans and non-commercial species;
- Maintain current EFH designations.

A letter from Perkins Coie LLP recommended:

- Use criteria that would limit the extent of EFH;
- Limit evaluation of non-fishing activities to those with substantial, identifiable effects;
- Limit measures recommended for non-fishing activities to those truly necessary to supplement those already in place;
- Consider direct and indirect socioeconomic effects on non-fishing entities of the designation of EFH;
- Delay the SEIS for EFH until revision of EFH regulations.

A letter from ReefKeeper International recommended:

- Identify all coral, hard bottom, seagrass, and mangrove areas as EFH;
- Identify all gear-related impacts to EFH;
- Consider options to minimize gear effects;
- Identify and assess non-fishing impacts to EFH;
- Describe options to mitigate effects of non-fishing activities.

At the St. John meeting, no members of the public offered comments.

At the St. Thomas meeting, a representative of the St. Thomas and St. John Fishery Advisory Committee commented on:

- lack of information indicating serious damage to habitat;
- sewage and toxic effluent discharges into marine waters; and
- benefits of artificial reefs as fish habitat.

At the St. Croix meeting, a representative of the U.S.V.I. Division of Fish and Wildlife commented on:

- illegal and accidental discharges, turbidity, and conflicts with fishing vessels caused by large commercial non-fishing vessels;
- sewage and toxic effluent discharges into marine waters; and
- impacts of coastal development on the marine environment.

A fisherman commented on:

- the need to close back reefs and seagrass beds to commercial fishing activities;
- impacts of coastal development on the marine environment;
- destruction of coral reefs; and
- lack of enforcement of recreational regulations.

A fisherman commented on:

- lack of enforcement of recreational regulations.

At the Hato Rey meeting, no members of the public offered comments.

At the Aricebo meeting, no members of the public offered comments.

At the Mayaguez meeting, a fisher commented on:

- lack of enforcement of recreational regulations.

At the Ponce meeting, a member of ReefKeeper International commented on:

- fish trap damage to EFH.

At the Culebra meeting, no members of the public offered comments.

At the Vieques meeting, a representative of Pescadores Unidos del Sur de Vieques commented on:

- activities of the Navy that impact seagrass beds, *Thalassia* areas, coral reefs; and
- impacts of coastal development on the marine environment;

At the Farjado meeting, the Council received comments from a representative of ReefKeeper International who commented on:

- a need for action to prevent damage to corals by traps; and
- recommendations for alternatives to prohibit placement of traps on coral habitats or on shallow seagrass beds.

## Appendix 7. Sources of Data

Data type	Source
Species-habitat associations	CFMC Generic EFH Amendment SSC-HAP members – pers. com. Scientific literature
Fish distribution	SEAMAP CFMC Generic EFH Amendment
Habitat locations	Kendall et al. 2001 USGS marine geologic maps of Puerto Rico
Catch data	Draft SFA document – SERO SEFSC database – J. Bennett, pers. com. Matos-Carraballo 2001
Effort data	SEFSC database – J. Bennett, pers. com.
Fishing impacts	Hamilton 2000 Barnette 2001 SSC-HAP members – pers. com.
Non-fishing impacts	CFMC Generic EFH Amendment SERO – pers. com. Scientific literature
Previous CFMC management measures	CFMC documents
Managed areas	SSC-HAP members – pers. com.
Spawning areas	CFMC documents Scientific literature